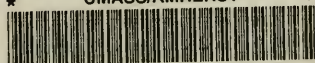


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MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF MAY, 1905.

MANAGEMENT OF MOWINGS.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1905.

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APPROVED BY

THE STATE BOARD OF PUBLICATION

CROP REPORT FOR THE MONTH OF MAY, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., June 1, 1905.

Bulletin No. 1, Crop Report for the month of May, the first monthly crop bulletin for the year, is herewith presented. As at present planned for, these bulletins will follow the usual lines for the year, with statistics regarding the crop conditions of the country, weather conditions in New England and throughout the remainder of the country, a summary of crop conditions compiled in this office from the reports of our correspondents, selected reports of correspondents, and at the close of the bulletin an article on some timely subject by some recognized expert. An article on "The management of mowings," by Prof. Wm. P. Brooks, professor of agriculture at the Massachusetts Agricultural College, is included in this bulletin. It is in a large measure supplementary to his article of last year on "The hay crop in Massachusetts," and contains much matter of value to all farmers.

PROGRESS OF THE SEASON.

The May returns to the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for May, 1905) show the area under winter wheat in cultivation on May 1 to have been about 29,723,000 acres. This is 1,432,000 acres, or 4.6 per cent, less than the area sown last fall, and 2,858,000 acres, or 10.6 per cent, more than the area of winter wheat harvested last year. The average condition for that remaining under cultivation was 92.5, against 91.6 on April 1 for the entire acreage sown, 76.5 on May 1, 1904, and 83.7, the mean of the May averages of the last ten years.

The average condition of winter rye was 93.5, as compared with 92.1 on April 1, 81.2 on May 1, 1904, 93.3 the year

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previous, and 88.5, the mean of the May averages of the last ten years.

The average condition of meadow mowing lands was 93.3, against 85 on May 1, 1904, 92.8 the year previous, and 90, the mean of the May averages of the last ten years.

The average condition of spring pastures was 92.3, against 80.5 on May 1, 1904, 92 the previous year, and 89.1, the mean of the May averages of the last ten years.

Of the total area of spring plowing contemplated, 71.5 is reported as actually done May 1, as compared with 57.3 per cent on May 1, 1903, and a ten-year average of 67.7.

In Massachusetts the average condition of meadow mowing lands was given as 91, the average condition of spring pasture as 87, and the proportion of spring plowing actually done as 36.

WEATHER SUMMARY, JAN. 1 TO MAY 1, 1905.

[FURNISHED BY WEATHER BUREAU, BOSTON.]

The weather of January was of the midwinter type, somewhat intensified, particularly with regard to temperature, the monthly mean ranging several degrees below the January normal in all sections. The cold weather was also continuous, there being an absence of the "January thaw," or mild period usual at this season. Ice-bound harbors caused more or less delay and much inconvenience to shipping. The precipitation, mostly snow, did not depart greatly from the monthly average, but the snow was badly drifted, thus impeding railroad and street car traffic. The most severe of the storms occurred on the 3d-4th, 6th-7th and 24th-25th, the last named being of unusual severity, on account of the very low temperature and winds of hurricane force that attended it.

February was a cold month, with a marked prevalence of fair weather. The temperature was uniformly low through the period and in all sections, and the monthly mean, 19.8°, one of the lowest for February of official record. The precipitation, averaging for the entire State 1.67 inches, was much below the monthly normal, and mostly in the form of snow; but owing to the low temperature, the ground was

generally covered with snow throughout the month. This month, with its low temperature, completed one of the coldest winters of authentic record. At Boston the mean temperature for the three months, — December, January and February, 1904–05, — 24.8° , is the lowest for the winter months since 1871, excepting 24.4° in 1903–04 and 24.5° in 1873–74.

The weather of March was exceptionally pleasant for this month, there being an entire absence of the severe storms frequently prevalent. The temperature was lower than the average until the closing decade, when there was a sudden change from winter to spring-like weather. The heavy accumulation of snow and ice on the ground disappeared gradually with the warmer weather, and no destructive freshets resulted. At the close of the month the ground was generally bare. The high temperature and other weather conditions were unfavorable to the flow of sap, and the maple sugar crop was below the average in quantity.

April was very pleasant, there being no marked departures from the average in the several elements of temperature, precipitation and sunshine. The day temperatures were generally below the average, while the night temperatures did not fall as low as usual in April. The mercury fell to freezing or below in nearly all sections during the month, and snow flurries and thin ice were reported. The precipitation, while somewhat below the average, was fairly well distributed. The weather conditions were generally favorable to farming operations. The month closed with the season near the average.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending May 8. — The week was warmer than usual in the Atlantic coast and Gulf districts, the central valleys, the greater part of the Lake region and the extreme north Pacific coast. From the northern part of the upper Lake region westward to central Montana and throughout the central and southern Plateau and Pacific coast regions the week was cooler than usual. Over the northern portion of the

west Gulf States, Arkansas, northern Mississippi, western Tennessee and in portions of the central Mississippi and lower Ohio valleys the rainfall was unusually heavy. The rainfall was below the average over the central Gulf States, and from New Mexico and western Texas northward over Kansas, northern Missouri, Iowa and northern Illinois. There was also less than average precipitation in the Middle Atlantic States and New England, and from western North Dakota to the north Pacific coast.

Week ending May 15. — The week was decidedly cool in the Plateau and Rocky Mountain regions and upper Mississippi valley, and below normal in the upper Mississippi valley and over the western portion of the upper Lake region. In New England the temperature averaged nearly normal. In the Middle and South Atlantic and Gulf States, the Ohio and central Mississippi valleys and lower Lake region the week was warmer than usual. The rainfall was excessively heavy generally throughout the central valleys, in the west Gulf States and in portions of the Middle and South Atlantic States. Over most of New England, and in portions of the lower Lake region and Middle Atlantic and east Gulf States, the rainfall was below the average.

Week ending May 22. — The week was cool in the north Pacific coast region from Colorado eastward over the central States and lower Lake region to the New Jersey coast, and in New England. In the upper Missouri and Red River of the North valleys the week was warmer than usual; and generally throughout the southern part of the United States, in a broad belt from the south Pacific coast to the Carolinas, the temperature of the week was slightly above the normal. The rainfall of the week was above normal from southern Kansas south-eastward to the Louisiana coast, in Mississippi, Alabama, Georgia, the Carolinas and northern New England. The deficiency in rainfall was most marked over the lower Missouri, central Mississippi and Ohio valleys.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending May 8. — New England. Boston: Cool, with frosts first half of week, but warmer and favorable latter half; rain needed in all sections; little damage from frost; farm work progressing well, but vegetation backward; little seeding done in north; tobacco, gardens, pastures and meadows good, but season ten days later than the average.

Week ending May 15. — New England. Boston: Weather favorable in southern portion, but too cool in northern portion; showers very beneficial, but rain still needed in most sections; much planting during week; rye heading in early fields; oats good; grass and tobacco excellent; vegetables and gardens very good; fruit promising; apples beginning to blossom; everything backward north.

Week ending May 22. — New England. Boston: Cool and cloudy; frequent rains retarded farm work and growth of vegetation, but rain beneficial; frost on four days did little damage; potatoes planted, except in north, and corn planting begun; apples less than average bloom, other fruits excellent; tobacco, grass, grain and vegetables good to excellent: some corn and potatoes receiving first hoeing.

THE WEATHER OF MAY, 1905.

The month opened with cool weather, and the temperature was generally below the average for this time of year till the 6th, when there was a sudden and marked rise, and the mercury remained well above till the 12th. The cool weather continued through the period till the 24th, the daily mean temperatures ranging from 2° to 10° below the normal in about all sections. The crest of the cool wave passed on the 16th and the 17th, with the minimum temperatures ranging below 40° in many localities. The 25th ushered in a warm "spell," and for the remainder of the month the daily temperatures ranged from 3° to 12° above the May normal. From the 14th to the 24th frosts occurred on several mornings in many sections. Tender vegetation suffered some

injury from the frost, although there was no great damage to crops or gardens. The cool weather, however, retarded vegetable growth and the germination of planted seeds.

While there was much cloudiness and unsettled weather through the month, there was a general and marked deficiency in the rainfall. From the 12th to the 19th local showers and scattered thunderstorms were quite prevalent, but the rainfall in most instances was light. The rainfall of the month was but little over half of the customary or normal amount for May. The weather was also marked by rather a high wind movement, and in some localities the high winds did considerable damage to newly set tobacco plants, and the general drying effect, with the droughty conditions, was unfavorable to crop interests. At the close of the month the season was estimated at from ten days to a fortnight late.

In the circular to correspondents, returnable May 24, the following questions were asked : —

1. How does the season compare, agriculturally speaking, with a normal season?

2. What is the promise for pastures and mowings, and did fall seeding winter well?

3. How did the bloom of apples, pears, peaches, plums and small fruits compare with the bloom of former years, and has it suffered from frosts?

4. What insects appear to be doing the most damage in your locality?

5. To what extent is spraying practised against insects attacking fruits, and is it on the increase in your locality?

6. Is farm help scarce or plenty; and what proportion can be called good help?

7. What are the average wages paid farm help in your vicinity, with board? Without board?

8. Will there be any marked change in the acreage of the usual farm crops, and do you note any new enterprises in the line of agriculture?

Returns were received from 155 correspondents, and from them the following summary has been compiled : —

THE SEASON.

April was about a normal month and May opened accordingly, but the weather of May has been so cold and dry that at present vegetation of all kinds is very backward and much in need of rain. It has been an excellent month for farming operations, and planting and sowing are unusually well advanced. The frosts in various sections on the mornings from the 19th to the 24th did some damage to early vegetables, but were not severe in any case, so far as reported. Rain and warmer weather are greatly needed for the development of all crops.

PASTURES AND MOWINGS.

There was a good snow covering on pastures and mowings throughout the winter, and, in consequence, grass generally wintered well. The lack of rain has been a drawback to grass of all kinds, and there is little feed in pastures in most localities, while mowings are also backward. The cold weather has operated to hold grass in check, so that while backward there is a thick bottom growth on all except worn-out mowings, and with seasonable moisture the hay crop should be up to the average. Fall seeding wintered well and shows the effects of lack of rain less plainly than old fields.

FRUIT BLOOM.

There was a fair bloom on apple trees, when it is considered that this is the off year in most sections, while the bloom on pears, peaches, cherries, plums and small fruits is reported to have been unusually heavy. Strawberries are blooming full though late. There was very little injury to fruit trees during the winter, and the reports would indicate that the recent frosts of the 19th to 24th were not heavy enough to do any practical injury to the fruit crop, unless it be to a few trees situated on low-lying land.

INSECTS.

At the time of making returns few insects had appeared, the cold weather probably having kept them in check, and those noted were doing little damage. Tent caterpillars

and cut worms were those most commonly complained of. Others mentioned are currant worms, potato bugs, wire worms and the brown-tail moth caterpillars.

SPRAYING.

Spraying of fruit trees is practically confined to those farmers who make more or less of a specialty of fruit growing, and these claim that they find it profitable, as would others if they could be persuaded to give it a trial. Practically all farmers use some insecticide on their potatoes, but a surprisingly small proportion of them take the trouble to use a fungicide to prevent blight and rot. As this is the off year for apples there will be less spraying of fruit trees than on the bearing year, though perhaps the falling off will not be as marked as usual, owing to the full set of other fruits.

FARM HELP AND WAGES.

Farm help appears to be in fairly good supply and most of it fair to good help, though there are but a limited number of strictly first-class farm hands. Twenty dollars per month with board is a fair average of the wages paid in the country districts, with slightly higher rates in and around the cities, while \$35 per month is the general rate without board. For day work the prevailing price seems to be \$1.50 per day in most sections, though in some the old rate of \$1.25 still prevails, except in haying and harvest time.

ACREAGE OF FARM CROPS.

For the State as a whole there will apparently be a slight increase in the acreage of corn and a slight decrease in that of potatoes. In the Connecticut valley a slight increase in the acreage of tobacco and a substantial increase in that of onions is indicated. An increase in the area under cranberry bog is reported from south-eastern sections. More forage crops are being planted than usual, and there are two reports of attempts to introduce alfalfa, with indifferent success thus far.

NOTES OF CORRESPONDENTS.

(Returned to us May 24.)

BERKSHIRE COUNTY.

Tyringham (E. H. SLATER). — The season is later than the normal, but is otherwise favorable. Pastures and mowings are in good condition, and fall seeding wintered well. All fruits have blossomed heavily, and have not suffered from frosts. Spraying is not practised in this locality. Farm help is scarce, and there is very little good help. Wages average \$20 per month with board. There will be no marked change in the acreage of the usual farm crops.

Becket (W. H. SNOW). — The season is cold and very dry. There is not much feed in pastures; fall seeding wintered well. All fruit trees will blossom full; no frosts as yet. No insects have appeared as yet. Spraying is little practised. Wages average \$20 per month with board, and \$30 per month without board. Farm help is scarce, and poor at that. There are no marked changes in the acreage of farm crops.

Stockbridge (F. A. PALMER). — The season is fully up to par. Pastures and mowings are in first-class condition, and fall seeding wintered well. Fruit trees show a full bloom all around, with no damage from frost. There is very little spraying done, but it is slowly on the increase. Farm help is very scarce, and only one-tenth of it is good help. Wages range from \$18 to \$25 per month, for eight months, with board, and from \$35 to \$45 without board. Farmers are not increasing their acreage of crops, owing to help being poor and high priced.

Washington (E. H. EAMES). — The season is considerably later than usual. Pastures and mowings are backward; fall seeding looks well. All fruits have given a good average bloom. Spraying is not practised in this locality. Farm help is scarce, and very poor. Wages average \$1 per day with board, and \$1.50 per day without board. The acreage of farm crops will be about the same as usual.

Peru (F. G. CREAMER). — The present season compares well with a normal season. Pastures and mowings never looked better; fall seeding wintered well. The fruit bloom has not suffered from frosts. Spraying is not practised in this locality. Farm help is scarce, and about half of it is good help. Wages average \$20 per month with board, and \$1.50 per day without board. There will be no marked changes in the acreage of farm crops.

Dalton (WESLEY B. BARTON). — The season is backward. Pastures, mowings and fall seeding all promise well. The fruit bloom looks well to date; hard frost the 22d, but too early to say whether it did damage. No insects have appeared as yet. Perhaps two per cent of our fruit is sprayed to prevent damage from insects. Farm help is scarce, but good wages get good help. Wages average \$20 per month with board, and from \$1.50 to \$1.75 per day without board. Some alfalfa is being tried.

Cheshire (L. J. NORTHUP). — The season is favorable so far as grass and grain are concerned. Pastures, mowings and fall seeding promise well. The bloom of fruit trees is full; frosts are prevalent, but doing no damage. Insects have not yet appeared. There is no spraying done in this locality. Farm help is quite scarce, and not much extra good help is to be had. Wages average \$20 per month with board, and \$35 without board. There is the usual acreage of potatoes, prices low; no new enterprise introduced.

Savoy (W. W. BURNETT). — The season has been cool, and vegetation has come forward slowly; rain would be beneficial. Pastures and mowings promise fairly well; fall seeding wintered well. Small fruits bloomed well and apples are showing well, but are not yet in full bloom. Very few insects have made their appearance. There is not much spraying done here. Help is scarce, and not more than half of it good help. Wages average from \$20 to \$35 per month, and from \$1 to \$1.50 per day. There is little change in the acreage of farm crops.

FRANKLIN COUNTY.

Charlemont (J. M. J. LEGATE). — The season is late, cold and dry, the rains all being followed by high winds. Pastures and mowings are backward; fall seeding has wintered well. Apples have bloomed fairly full, but not enough for a heavy crop; pears, peaches and plums made a very heavy bloom; too early to be certain whether they have suffered from frosts. Spraying is not practised at all in this locality. Farm help is scarce, but most of that available is good. Wages average \$20 per month with

board, and \$1.50 per day without board. The acreage of farm crops will remain about the same as usual.

Bernardston (R. H. CUSHMAN). — The season does not promise very well. Pastures are in need of rain; fall seeding wintered well. Fruit trees have bloomed very full; frosts from 19th to 24th were unseasonable, and I think caused damage in low-lying areas. Tent caterpillars are doing some damage. Farm help is scarce, and 10 per cent of it is good help. Wages range from \$20 to \$25 per month with board, and from \$1 to \$1.50 per day without board. The acreage of sweet corn for the cannery at Brattleboro, Vt., will be larger than last year.

Ashfield (CHAS. HOWES). — The season has been cold, and not quite up to the average. Mowings and pastures are looking well now, and fall seeding wintered well. Fruit trees of all kinds blossomed very full, and have not suffered from frosts. Spraying is practised to some extent, and is rather on the increase. Farm help is scarce, but is mostly native help, and good. Wages range from \$20 to \$25 per month with board, and average \$1.50 per day without board. There is the usual acreage of the usual farm crops.

Deerfield (H. A. WELLS). — The season is fully a week late. Pastures and mowings are backward, and need rain; fall seeding wintered well. The fruit bloom was very full; heavy frost on the 22d, damage not known. No insects have appeared. Spraying is not practised in this locality. Farm help is very plenty, mostly Polanders, and generally good help. Wages average from \$20 to \$24 per month with board, and \$1.50 per day without board. There is a large increase in the acreage of onions.

Sunderland (GEO. P. SMITH). — The season opened normally, but is now backward, from lack of heat and moisture. Fall seeding wintered well, but pastures and mowings have made small growth. Pears, plums and small fruits made a full bloom; apples good, except Baldwins; frost 21st and 22d; cannot estimate damage as yet. Very few insects have appeared. Hardly any spraying is done, and it is not on the increase. Supply and demand of help about even; mostly Polish, and good, but need directing. Wages average \$20 per month with board, and \$1.50 per day without board. There is a slight increase in the acreage of onions and tobacco. Onion seed germinated well, but they have not made a normal growth.

Northfield (THOS. R. CALLENDER). — The season is ten days later than normal, and rain is badly needed. Grass is thin; fall seeding generally wintered well. Fruit trees, except peaches, full of bloom; frost on 21st and 22d did damage on low lands.

No complaint of insect injury. Spraying is not practised at all. Farm help is scarce, mostly Polish, and fairly good. Wages average \$25 per month with board, and from \$1.50 to \$1.75 per day. There is quite an increase in the acreage of potatoes.

Wendell (N. D. PLUMB). — The season is very backward. Fall seeding is looking well; mowings and pastures in need of rain. Fruit trees of all kinds in full bloom, with no damage from frost to date. No insects as yet. Spraying is little practised. Farm help is scarce, and about half of it good help. Wages average \$1 per day, or \$18 per month, with board, and \$1.50 to \$1.75 per day without board. Farmers are planting more corn and less potatoes this year.

New Salem (DANIEL BALLARD). — The season is cold and deficient in rainfall. Pastures and mowings are looking fairly well; fall seeding wintered well. Large bloom of apples, peaches and plums; pears light; hard frost on low land the 22d. Weather too cold for insects as yet. Little spraying is done, and it does not increase much. Farm help is scarce, and about half of it good help. Wages average \$20 per month with board, and from \$1.50 to \$1.75 per day without board. The acreage of farm crops is about the same as usual.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — The season is two weeks late, and very cold and dry. Fall seeding wintered well, grass poor in mowings and pastures from lack of rain. Apples made a good bloom for off year; other fruits average; some damage from frost on low land the 21st and 22d. A few tent caterpillars have appeared. Farm help is rather scarce, but mostly good. Wages average \$20 per month with board, and \$1.25 or \$1.50 per day without board. There are no marked changes in the acreage of farm crops. Fruit trees suffered severely during the winter from girdling by field mice.

Amherst (WM. P. BROOKS). — The season is unusually favorable for farm work, which is well advanced. Pastures and mowings promise well, though in need of rain; fall seeding wintered unusually well. Apple bloom uneven, but fairly full; peaches, plums and currants very full; raspberries and blackberries considerably winter-killed; strawberries average. Only a few specialists spray, and it is not increasing much. Farm help is average in supply and quality. Wages average from \$18 to \$20 per month with board, and from \$30 to \$45 without board. There are increased acreages of onions and tobacco.

South Hadley (W. F. PERRIN). — Pastures are in fair condition, and mowings look well; fall seeding wintered well. Early apples made a full bloom; winter apples light; no damage from frost. There is little spraying done here, and it is increasing but slowly. Help scarce, and one-third of it good help. Wages average \$20 per month with board, and \$35 per month without board. Less potatoes and more corn are being put in than usual.

Hatfield (THADDEUS GRAVES). — The season is cold, dry and windy. Fall seeding wintered well, but pastures and mowings are in need of rain. Fruit bloomed abundantly, with no damage from frosts. Wire worms are doing some damage. Spraying is little practised, and is not increasing. Farm help is plenty, but very little of it is good help. Wages average \$20 per month with board, and \$35 per month without board. The acreage of onions is increased one-third and that of tobacco 5 per cent.

Northampton (H. C. COMINS). — The season is a week late, and is cold and dry. The cold, dry weather is telling on pastures and mowings; fall seeding wintered fairly well. There was a very full bloom of all fruits, with no frosts to do damage as yet. Cut worms are doing some damage. Spraying is quite extensively practised, and is on the increase. Wages average \$20 per month with board, and \$35 without board. There is a slight increase in the acreage of onions and tobacco.

Easthampton (WM. C. CLAPP). — The season is late and cold. Pastures need rain; low mowings are looking well. There was a fair fruit bloom, and it is too soon to tell how much it was injured by frost. Tent caterpillars and potato bugs are doing some damage. Spraying is little practised, and is not increasing. Farm help seems to be plenty, and from one-half to three-fourths of it is good help. Wages range from \$15 to \$25 per month with board, and from \$1.25 to \$1.75 per day without board. There is an increased acreage of onions.

Westhampton (H. A. PARSONS). — The season is a good average one. Grass is looking well, but needs rain. There was a good fruit bloom, and no damage from frosts. Insects are not doing any damage as yet. Farm help is scarce, and is mostly Polish. Wages range from \$15 to \$25 per month with board, and average \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Middlefield (J. T. BRYAN). — The season is somewhat backward, cold and dry. Fall seeding is in good condition; there is promise of a good hay crop, and pastures are fairly good. Fruit trees blossomed well, with no injury from frost. Spraying of fruit trees is not practised. Help is scarce, and good help hard

to secure. Wages average \$20 per month with board, and \$1.50 per day without board. There are no new departures in agricultural lines.

HAMPDEN COUNTY.

Tolland (W. M. MOORE). — The season is cold, dry and backward. Pastures and mowings are much in need of rain; fall seeding wintered fairly well, except on very wet, low land. Fruit trees bloomed full, and have not as yet been damaged by frost. The tent caterpillar is doing some damage. Spraying is not practised to any extent. Farm help is very scarce, — that is, good help. Wages average \$25 per month with board, and \$1.50 per day without board. There are no changes in the acreage of farm crops.

Southwick (L. A. FOWLER). — The dry weather is keeping back corn and potatoes. Pastures and mowings need rain; fall seeding wintered well. All kinds of fruit trees showed an abundant bloom. Spraying is not practised at all. Farm help is plenty, and about one-fourth of it is good help. Wages average \$18 per month with board, and \$1.50 per day without board. There are no changes in the acreage of farm crops; a few are changing from Havana seed to broad-leaf tobacco.

Russell (E. D. PARKS). — The season is very backward, although plowing and planting are well along. The dry weather is very bad for pastures; fall seeding wintered well. There was a good fruit bloom, and no damage from frosts. Tent caterpillars and currant worms are doing some damage. Spraying is not much practised, but is increasing. Farm help is very scarce, and mostly poor help. Wages average \$1 per day with board, and \$1.50 without board. There are no changes in the acreage of farm crops.

West Springfield (T. A. ROGERS). — The season is very dry and cold; all cultivated crops are backward. Pastures are short and mowings late; fall seeding wintered well. Apples and peaches made a full average bloom; pears and plums light; small fruits will bloom full; frosts on 21st and 22d. Tent caterpillars, cut worms and currant worms are doing some damage. Spraying is not as much practised as it should be, and is not on the increase. Farm help is not plenty, and very little of it is good help. Wages range from \$20 to \$25 per month with board, and from \$1.10 to \$1.50 per day without board. There is some increase in the acreage of potatoes and onions.

Ludlow (CHAS. B. BENNETT). — The season is about two weeks late. Fall seeding looks well, but all grass needs rain. All trees

blossomed full, but some have suffered from frosts. Tent caterpillars are doing some damage. Very little spraying is done. Farm help is very scarce, and hardly any of it good help. Wages average \$25 per month with board, and \$1.50 per day without board. More silos are being put in, and consequently the acreage of corn increased.

Hampden (JOHN N. ISHAM). — The season is dry and cold, with light frosts. Pastures are starting slowly, and mowings show the effects of the hard winter. Fall seeding wintered well. Winter apples made a light bloom; pears and peaches quite full; plums light. Currant worms are doing some damage. Spraying is very little practised, but is on the increase. Wages average \$20 per month with board, and \$25 to \$30 per month without board. There is more corn put in for the silo and less for grain than formerly.

Monson (F. D. ROGERS). — Fruits are a week ahead of the normal, but grass is backward. Pastures are very poor; mowings in good condition, but late; fall seeding wintered well. There was a good bloom of all fruits except some varieties of apples; no damage from frost. Cut worms are worse than usual; tent caterpillars not as plenty as usual. Very little spraying is done here. There is about enough farm help to supply the demand, and it averages fairly well. Wages average \$20 per month with board, and \$1.50 per day or \$30 per month, with tenement and other privileges, without board. There is no change in the acreage of farm crops.

Holland (FRANCIS WIGHT). — The season is cold and backward. Pastures and mowings are looking fairly well; fall seeding wintered well. The fruit bloom is not up to the average of former years, but has not suffered from frosts. Insects have not appeared to any extent. Spraying is not practised much about here. Farm help is scarce, and hard to get. Wages average \$1 per day with board, and \$1.50 per day without board. There will be about the usual acreage of farm crops.

WORCESTER COUNTY.

North Brookfield (JOHN H. LANE). — The season is late and cold, and was dry until the last week. Pastures are backward, but are coming on. Apples made a fair bloom; pears small; peaches good; no harm from frosts. Tent caterpillars are doing some damage. Very little spraying is done here. Help is scarce, and half of it good help. Wages range from \$15 to \$20 per month with board, and average \$1.50 per day without board. There is no marked change in the acreage of farm crops, but I find many putting in potatoes.

Spencer (H. H. KINSBURY). — The season is about normal in some features and backward in others. Fall seeding is in fine condition, and with good rains pastures and mowings will produce average yields. There has been an unusually full fruit bloom, and no injury from frost. The cool, dry weather has been unfavorable to insects. There is the usual scarcity of farm help. Wages are the same as in former years. There will be little change in the usual acreage of farm crops this season.

Oakham (JESSE ALLEN). — The season is fully up to the average. Rain is greatly needed by pastures and mowings; fall seeding looks well. There was a light bloom of all fruits, and no damage from frosts. Spraying is not practised in this locality. Farm help is plenty, and perhaps half of it is good help. Wages average \$20 per month with board, and \$30 without board. More ensilage corn has been planted and less potatoes than usual.

Hubbardston (C. C. COLBY). — Crops are very backward, owing to lack of rain and the unusually cold weather. Feed in pastures starts very slowly, and mowings, especially old fields, are light. The bloom of apples, pears and plums is unusually heavy for an off year, and there have been no frosts that did damage. There is not a spraying outfit in this section. Good farm help is always scarce. Wages range from \$18 to \$26 per month with board, and from \$1.50 to \$2 per day without board. There will be about the usual acreage of staple crops, but more truck will be put in, especially early peas.

Templeton (LUCIEN GOVE). — The season is late and dry. Pastures and mowings are greatly in need of rain; fall seeding generally wintered well. There was a full bloom of pears, plums and small fruits; Baldwin apples rather light; other varieties average. Tent caterpillars are doing some damage. But little spraying is done, and it is not increasing to any extent. Help is very hard to get, and most of it is unreliable. Wages average from \$18 to \$22 per month with board, and from \$1.50 to \$2.25 per day without board. There will be less dependence placed on hay than formerly, as more forage crops are being put in.

Ashburnham (E. D. GIBSON). — The season is backward, with much below normal temperature and rainfall. Fall seeding wintered well; pastures never in poorer condition at this date. All fruits bloomed well, but are at least ten days behind. Spraying is very little practised, and is not gaining in favor. Farm help is scarce, and not one-fourth of it really good. Wages average from \$20 to \$30 per month, and \$1.50 per day. There will be few changes in the usual acreages of farm crops.

Fitchburg (Dr. JABEZ FISHER). — Everything has wintered un-

usually well, and has a good start, but needs rain. Pastures and mowings promise well, with rain. There was a full bloom of all kinds of fruits except apples, of which the bloom was only moderate; no damage from frosts. Cut worms are doing some damage. For best results spraying is indispensable, and is gradually increasing. Farm help is scarce, especially of the better class. Wages average \$20 per month with board, and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Bolton (H. F. HAYNES). — The season is late and dry, and seeds are not germinating well. Old mowings wintered-killed badly. The fruit bloom was more abundant than usual in off years, and there has been no damage from frost. Very few spray in this locality. Wages average from \$20 to \$25 per month with board, and \$1.75 per day without board.

Worcester (SILAS A. BURGESS). — The cool weather has been favorable to grass and fruit bloom, and with reasonable moisture and warm weather in June the hay crop will be large. Fruit bloom above the average, with no damage from frost. Currant worms and tent caterpillars are doing some damage. Spraying is practised to quite an extent, and is on the increase. Farm help is scarce, and about half of it is good help. Wages average \$23 per month with board, and \$1.50 per day without board. Nitro-culture for leguminous crops is being tried to some extent.

Auburn (WM. GILBERT). — The season is very cold and somewhat dry. Pastures and mowings look well, and fall seeding wintered well. All fruit trees have blossomed well, and there has been no injury from frost, although we have frost every night. Tent caterpillars are doing some damage. There is very little spraying done here, but it is increasing a little. Farm help is scarce, and about half of it good help. Wages average \$25 per month with board, and \$1.50 per day without board. There will be no marked changes in the acreage of the usual farm crops.

Hopedale (DELANO PATRICK). — The season is backward, especially for planting. Pastures and mowings look well, and fall seeding wintered well. Apples made a very full bloom for an off year; other fruits average; nothing has been injured by frosts. Currant worms are doing some damage. Spraying is practised to a small degree, and is slowly increasing in favor. Farm help is very scarce, and only a small part of it is good help. Wages average \$1.75 per day without board. There is no noticeable change in the acreage of farm crops.

Mendon (J. J. NUTTER). — The season compares favorably with the normal. Fall seeding is looking well, but pastures are back-

ward. There has been no frost to do damage to fruit. There is a partial fruit bloom, differing in degree in different localities. Spraying is very little practised hereabouts. Farm help is scarce, and but a small proportion of it is good help. The acreage of farm crops is about the same as usual.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — The season has been dry and cold. Pastures and mowings are greatly in need of rain; fall seeding looks well. There has been a full fruit bloom, with no damage from frosts. There are no insects doing damage. Spraying is not practised in this locality. There is very little farm help hired here. Wages average from \$18 to \$20 per month with board, and \$1.50 per day without board. There are no marked changes in the acreage of the usual farm crops.

Framingham (J. S. WILLIAMS). — The season has been very dry and cold, and compares unfavorably with the normal. Pastures are dry and brown; fall seeding wintered finely, but we need rain badly. There has been a very full bloom of all kinds of fruit, with no damage from frosts. There is some spraying done in this locality. Farm help is not plenty, and about one-fourth of it can be classed as good help. Wages average \$22 per month with board, and \$35 without board. There will be about the usual acreage of farm crops.

Stow (GEO. W. BRADLEY). — The season is an average one in most respects. Pastures are backward; mowings and fall seeding look well. There is a very good fruit bloom in most orchards and no damage from frost. There is not as much spraying done here as formerly. Help is scarce, and there is very little good help. Wages range from \$10 to \$25 per month with board, and from \$1.50 to \$2 per day without board. There is no great change in the acreage of farm crops; quite a good deal of asparagus is being set.

Dunstable (A. J. GILSON). — The crops and the season are at least two weeks later than the normal. Pastures and mowings are very backward, and need rain and warmer weather. As a whole, there has been about a normal bloom of all fruits; severe frost on the 22d, but it is uncertain as to how much damage it did. There is no spraying done hereabouts. Wages range from \$1 to \$1.25 per day with board, and \$1.50 per day without board.

Chelmsford (P. P. PERHAM). — The season is much more backward than the normal. Pastures and mowings promise well, and fall seeding wintered well. Good bloom of winter apples, fall varieties not as good; small fruits promise well; no damage from

frosts. There is very little spraying in this vicinity. Farm help is very scarce, and not over a third of it is good help. Wages average \$20 per month with board, and \$30 without board. There will be a very large acreage of potatoes.

Teuksbury (G. E. CROSBY). — Rain and warmer weather are sadly needed. Apples made about half a normal bloom; pears and plums good; peaches light. Cut worms are doing some damage. Spraying is but little practised here. Farm help is more plenty than last year, and rather better. Wages average \$1 per day and from \$12 to \$25 per month with board. There will be few changes in the acreage of the usual farm crops.

Concord (WM. H. HUNT). — The season is late, and has been very dry. Fall seeding wintered well, and mowings look well. Pears and apples have blossomed full, and there has been no injury from frost. There are few tent caterpillars this year. The practice of spraying does not increase very rapidly. It is difficult to get good farm help, and only a small part of it is first class. Wages average from \$20 to \$25 per month with board, and \$1.75 per day without board. The crops grown are about the same as usual.

Stoneham (J. E. WILEY). — The season is not up to the average. Pastures and mowings are backward, and fall seeding did not winter well. Apples made a good bloom and pears a light one, but have suffered from frosts. The brown-tail moth is doing the most damage of any insect. Spraying is practised to a slight extent, and is on the increase. Farm help is plenty, and half of it is good help. Wages average \$20 per month with board, and \$35 without board. There will be no marked changes in the acreage of the usual farm crops.

Arlington (W. W. RAWSON). — The spring was late and very dry, so that all fields could be worked when required. Seeds came up well, and crops look very well, but need rain. There was a very full fruit bloom, with no injury from frost. Gypsy and brown-tail moths are doing the most damage of any insects. Spraying is practised very extensively hereabouts. Wages average \$20 per month with board, and \$40 without board. Farm help is plenty, but very poor.

Newton (GEO. L. MARCY). — The season has been colder than usual. Pastures and mowings look well at present, and fall seeding wintered well. The fruit bloom was very heavy, and I think it has not suffered from frosts. Spraying is not practised in this locality. Farm help is equal to the demand, and is mostly good help. Wages average from \$20 to \$25 per month with board, and from \$10 to \$12 per week without board. There are no marked changes in the acreage of the usual farm crops.

ESSEX COUNTY.

Haverhill (EBEN WEBSTER).—The season is cold and backward. Fall seeding wintered well, and pastures and mowings look well. There has been about an average fruit bloom and it has not suffered from frosts. Tent caterpillars and brown-tail moths are doing some damage. Spraying is practised to a considerable extent and is on the increase. Good farm help is scarce, one-fourth of the supply being of that class. Wages average \$20 per month with board, and \$1.50 per day without board. There were heavy white frosts on the mornings of the 21st and 22d, but not much damage to crops.

Groveland (A. S. LONGFELLOW).—The season is cold and rather backward, with not enough rain. There is not much feed in pastures, but fall seeding looks well. Apples made a good bloom for an off year; pears, peaches and plums bloomed full. Spraying is not practised for any insects except canker worms. Good help is scarce. Wages average \$20 per month with board, and \$30 per month without board. There are no marked changes in the acreage of farm crops.

Andover (M. H. GOULD).—The season is backward. The promise for pastures and mowings is very poor, but fall seeding wintered well. Fruits blossomed well for the off year, and have not suffered from frosts. Spraying is practised but little, yet is on the increase. Farm help is scarce, and very little of it good help. Wages average \$22 per month with board, and \$1.50 per day without board.

Topsfield (B. P. PIKE).—The season is about a normal one. Pastures are looking well, and fall seeding very well. All fruits have bloomed well, and there has been no damage from frosts. There are plenty of brown-tail moths here. Spraying is not much noticed and does not increase much. Farm help is scarce and not much of it is first class. Wages average \$25 per month with board, and \$1.75 per day without board. There will not be quite as large an acreage of any kind of farm crops as usual. Milk is six cents per can higher than five years ago; potatoes and greens the lowest for years.

Wenham (N. P. PERKINS).—Everything is rather backward, and seeds have not germinated well. Pastures are rather bare; well-manured fields are looking well, as is also fall seeding. There was quite a good fruit bloom. Tent caterpillars and brown-tail moths are the most common insects. Spraying will commence soon to a limited extent. Help is fairly plenty, and one-third of it good help. Wages range from \$15 to \$25 per month with board, and average \$1.50 per day without board.

Manchester (JOHN BAKER). — The spring has been cold and dry and is backward. Pastures promise well; fall seeding winter-killed somewhat. The fruit bloom is better than formerly and has not suffered from frost. Brown-tail moths and tent caterpillars have appeared. Spraying is practised somewhat and is on the increase. Help is plenty and pretty good. Wages average \$30 per month and \$2 per day. There is no marked change in the acreage of farm crops.

NORFOLK COUNTY.

Randolph (RUFUS A. THAYER). — The season has been very cold, with little rain. Grass is very late and much in need of sun and rain. There was an excellent bloom on most fruits of all kinds and no damage from frost. There is a very limited amount of spraying being done. Good help is not plenty, but there is a fair supply of Italians who can speak English. Wages average from \$20 to \$25 per month with board, and \$35 to \$40 per month and \$1.50 to \$1.75 per day without board. There is no marked change in the acreage of farm crops.

Norwood (FRANK A. FALES). — The season is two weeks late and cold and dry. Pastures are late, but mowings and fall seeding look well. Bloom of apples and pears extra good; bloom late on small fruits, and they have not been injured by frosts. Spraying is practised for small fruit in a small way and is not increasing. Good help is very scarce. Wages average from \$20 to \$25 per month with board, and from \$1.75 to \$2 per day without board. More Japanese millet for forage is being sown than ever before.

Walpole (EDWARD L. SHEPARD). — The season is late, but is otherwise favorable. Pastures and mowings look well but are late; fall seeding looks fairly well. The bloom of all fruits is above the average for the odd year; no damage from frost. Tent caterpillars are doing some damage. Very little spraying is done here and there is no noticeable increase. Help is scarce. Wages average \$20 per month with board, and from \$1.50 to \$2 per day without board.

Millis (E. F. RICHARDSON). — The season is a little late on account of lack of rain. Pastures and mowings promise well with rain; fall seeding wintered well. No insects are doing any damage at present. Spraying is practised somewhat and is increasing. Farm help is plenty, and half of the supply good help. Wages average \$25 per month with board, and \$40 without board. The acreage of forage crops is on the increase.

Franklin (C. M. ALLEN). — The season is an average one. Pastures and mowings are in no better condition than usual; fall

seeding wintered finely. All fruits except pears made a full bloom and have not suffered from frost. Spraying is but little practised. Farm help is plenty, but only from 5 to 10 per cent is good help. Wages range from \$20 to \$25 per month with board. There are no marked changes in the acreage of the usual farm crops.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — The season is a few days later than usual, otherwise about normal. The present prospects of pastures and mowings are favorable; fall seeding generally good. The fruit bloom was extra good, and though it has suffered slightly from frosts the indications are that there will be plenty left. Currant worms and plum curculios are doing some damage. There is very little spraying done except on currants and gooseberries, and it is rather decreasing than otherwise. There is about enough good help to meet the requirements. Wages average \$18 or \$20 per month with board, and \$1.50 per day without board. The winter was remarkably cold, but deciduous trees and stoned fruits suffered less than usual and evergreens much more.

Attleborough (ISAAC ALGER). — The season is a normal one. Pastures and mowings are in average condition, and fall seeding wintered well. The fruit bloom was abundant, with no damage from frosts. Spraying is not practised in this locality. Farm help is plenty, but poor. Wages average \$20 per month, and \$1 per day with board. There have been fewer potatoes planted than last year.

Dighton (JAMES N. PAUL). — The season is late and has been cold and dry. Pastures are good; mowings light and backward; fall seeding wintered well. Apples, pears and plums made a very full bloom, as did also peaches where the trees are alive. Cut worms are doing some damage. Spraying is little practised, and is on the decrease in this locality. Farm help is very scarce. Wages range from \$10 to \$20 per month with board, and from \$1.25 to \$1.50 per day without board. Strawberry beds are looking well, but are late in blooming, and the crop will be late.

Berkley (ROLLIN H. BABBITT). — The season is about ten days late. Pastures are short as yet, and the ice injured fall seeding. Apples, pears and plums promise well. There are not many insects as yet, but tent caterpillars are increasing. Many fruit growers are beginning to practise spraying. Help is not very plenty, and a large proportion of it is poor. Wages average \$20 per month with board, and \$1.50 per day without board. The acreage of farm crops is less than for several years.

Acushnet (M. S. DOUGLAS). — The season is rather backward. Pastures and mowings are good, but fall seeding did not winter very well. There is a large bloom of apples, pears, plums and small fruits; no peaches; no damage from frost. Cut worms are doing some damage. Most fruit growers are spraying and it is on the increase. Farm help is scarce and one-fourth of it good help. Wages average from \$18 to \$20 per month with board, and from \$1.25 to \$1.50 per day without board for good help. Peas and potatoes are looking well; too cold for asparagus, corn and beans.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Owing to the dry, cold weather seeds do not come up well. Fall seeding wintered well, but will turn out poorly unless we have rain. There was generally a good fruit bloom, and it has not suffered from frost. Tent caterpillars are appearing but are not very plenty. Spraying is not much practised in this vicinity. Farm help is scarce, and not over 25 per cent of it good help. Wages average \$18 per month with board, and \$1.50 per day without board.

Marshfield (JOHN H. BOURNE). — The season has been exceedingly dry and rather cold, so that vegetation is backward, but work well advanced. Pastures and mowings promise very unfavorably; fall seeding wintered well, but is short. There was quite a full fruit bloom, with no damage from frost. Tent caterpillars and cut worms are doing some damage. Spraying is little practised except for potatoes, and is not increasing. Farm help is plenty, and about half of it good help. Wages average from \$18 to \$25 per month with board, and \$1.50 per day without board. A large amount of cranberry bog is being made in this town.

Hanson (FLAVEL S. THOMAS, M.D.). — The season is cold and backward, with frosts several nights within a week, doing some damage. Pastures and mowings look well. There was a very full fruit bloom. Spraying is but little practised hereabouts. Farm help is plenty, and mostly fair help.

Halifax (G. W. HAYWARD). — The season is cold and backward. The prospect for pastures and mowings is not good, owing to dry weather. All kinds of fruit blossomed full, and there has been no damage from frost. Not much spraying has been done as yet, but it will increase. Farm help is scarce, and not very good. Wages average \$20 per month with board, and \$1.50 per day without board. There will be a marked increase in the acreage of potatoes; other crops about as usual.

Lakeville (N. G. STAPLES). — The season is rather late. Pas-

tures and mowings are in normal condition, and fall seeding is looking well. The fruit bloom was above the average, especially for peaches and apples, and has not been affected by frosts. Cut worms are doing some damage. Spraying is not practised to any extent. Farm help is scarce, and not over half of it good help. Wages average \$18 per month with board, and \$1.50 per day without board. The acreage of strawberries and asparagus is increasing hereabouts.

Wareham (A. B. SAVARY). — The season is about ten days late. The promise is good for pastures and mowings, and fall seeding wintered well. The fruit bloom is normal, and has not suffered from frosts. Cut worms are very plenty. Very little spraying is done, but it is increasing slowly. Farm help is scarce, and about half of it good help. Wages average \$20 per month with board, and \$1.50 per day without board. Cranberry vines were very badly winter-killed the past winter where not covered with water.

BARNSTABLE COUNTY.

Sandwich (R. F. ARMSTRONG). — The season is cold and dry and two weeks late. Pastures have made little growth and mowings are short, but otherwise looking well. The fruit bloom is much heavier than last year. Spraying is on the increase, and one-half the orchards in this locality will get two or more sprayings. Farm help is very scarce, and on a small percentage is good help. Wages average \$1.50 per day with board. A larger acreage of potatoes than usual will be planted, and several acres of new cranberry bog will be set out. One of our enterprising young men has purchased a spraying outfit, and is spraying orchards and cranberry bogs on contract.

Mashpee (W. F. HAMMOND). — The season is below the average. Pastures and mowings are about average, and fall seeding wintered well. Apples, pears, peaches and small fruits made more than an average bloom. Tent caterpillars and cut worms are doing some damage. Spraying is practised to some extent and is increasing. Farm help is quite plenty, and two-thirds of it is good help. Wages average \$1 per day with board, and \$1.50 per day without board. There will be about the usual acreage of farm crops.

Dennis (JOSHUA CROWELL). — The season is later than normal. Grass was rather slow in starting, but with the recent rains is now looking fairly well. There is an average fruit bloom, and no frost damage as yet. Tent caterpillars are doing some damage. Farm help is rather scarce, and perhaps one-third of it is good help. Wages average \$25 per month with board, and \$1.50 to \$2 per day without board.

Brewster (THOS. D. SEARS). — The season compares favorably with the normal. The promise for pastures and mowings is rather poor on account of dry weather; fall seeding wintered well. The fruit bloom compares favorably with other years. Tent caterpillars are doing some damage. Spraying is practised to some extent and is on the increase. Farm help is plenty, and the majority is good help. Wages average \$30 per month with board, and \$40 per month without board. The acreage of farm crops is the same as usual.

Truro (D. E. PAINE). — The season is backward. Pastures and mowings promise fairly well. There is a good fruit bloom for all kinds of fruit. Tent caterpillars are doing some damage. Spraying is not very extensively practised. Farm help is scarce, but nearly all of it is good help. Wages range from \$20 to \$30 per month without board.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — The season is much later and colder than usual. Pastures and mowings promise well; very little if any fall seeding done here. The fruit bloom is better than average, and there is no damage from frost. There will not be any more spraying than usual done this year. Farm help is rather scarce, and about one in four is good help. Wages range from \$15 to \$30 per month with board, and from \$1.50 to \$2 per day without board. There are no changes in the acreage of the usual farm crops.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — The season is about ten days late. Mowings and pastures promise well, and fall seeding wintered well. There is practically no fruit grown in this county. Cut worms are doing some damage. Farm help is scarce, and most of it poor. Wages average \$20 per month with board, and \$35 without board. Poultry culture has interested quite a number of our farmers, several of whom have raised over a thousand chickens each.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

THE MANAGEMENT OF MOWINGS.

By Prof WM. P. BROOKS, *Professor of Agriculture, Massachusetts Agricultural College.*

The paper on "The hay crop in Massachusetts," prepared for the May Crop Report in 1904, treated the subject in a general but at the same time in a fairly comprehensive way. The writer is now asked to present a second paper on the same topic, and to go into greater detail concerning certain branches of the subject. Owing to the general nature of the first paper, there will almost of necessity be some repetitions of matter therein contained in this; but the writer trusts this will be pardoned, as such repetitions as will be made seem necessary in order to make this paper fairly complete in itself.

THE VARIETIES OF GRASSES AND CLOVERS.

There are but few of the species of grasses which have been recommended for cultivation which are well known to our farmers; and it shall be the first object of this paper to give in condensed form such information affecting the value for practical purposes of the different species as seems likely to prove most useful in the direction of enabling readers to select varieties suited to conditions.

All the different common varieties of grasses may be first divided into two great classes, which may be called respectively sod-formers and non-sod-formers. The sod-forming grasses are all capable of constant renewal by the formation of new plants between the plants first established. In the case of most of the sod-formers which will be spoken of, this multiplication of the plant is accomplished through the agency of an underground stem, similar to the well-known pointed, white and jointed underground stem of witch grass, which is so frequently pictured as growing through a potato, for example, and which is generally so well known. These underground stems extend through and through the ground in the neighborhood of the plants from which they start. They are jointed, and provided with roots springing from near the joints. At each joint there is a bud from which a new stem pushes up into the air. From this centre a new plant is formed. This in turn produces underground stems, and the soil is gradually filled fuller and fuller of such stems, crowding through it in all directions and all sending up new stems from the joints. In the case of all the sod-forming grasses, then, the tendency is for the turf to become constantly thicker, closer and finer. The surface of the ground is completely covered, and a thick, tough sod or turf, firmly held together by the underground stems and by

the roots, is formed. Grasses of this character are persistent, and they are not likely to die out under the action of natural causes nor to be crowded out by other species. Among such grasses meadow fescue and tall meadow fescue, Kentucky blue-grass, awnless brome grass and red-top are the more important.

There are a few grasses which spread and form a turf gradually thicker and thicker, by rooting at the lower joints of the stem. The stems of such grasses incline to bend near the base, so that the lowermost joint and perhaps the second joint also comes to rest on the surface of the ground. Under these circumstances, if the soil is moist, roots are sent out from the joints in contact with the ground, and thus the plant spreads and gradually forms a turf which becomes thicker and thicker with the lapse of time. The bent grasses are of this description. Grasses having this habit, like those having the underground stems which have been spoken of, are persistent.

The non-sod-forming grasses are not provided with either of these means of renewing themselves. Each plant comes from a seed. The plant, originally small, gradually increases in size, until from a single root a very considerable number of stems may be produced. In other words, these grasses stool freely. As a consequence of the stooling habit, many of them ultimately form tufts which make the surface quite uneven. Between the tufts formed by the individual plants there may be spaces which are relatively bare. Orchard grass and sheep's fescue are prominent representatives of grasses having this habit, while the common timothy, tall oat grass, yellow oat grass and the rye grasses are less likely to form tufts, but propagate themselves only by stooling or from seed. Most of the non-sod-forming grasses are rather likely to be crowded out of permanent mowings by the sod-formers, which have an advantage in the struggle for existence.

SOME OF THE MORE IMPORTANT GRASSES DESCRIBED.

Timothy.—This variety is so well known that it seems almost unnecessary to describe it, but some of the principal reasons why it is a favorite and a statement of a few of its peculiarities may be of interest. Timothy is a large, moderately coarse grass, producing relatively little leaf and a large proportion of stem. The hay made from it is comparatively coarse and strawy, but the character of its growth is such that it may be readily cured. The hay is, therefore, perhaps more certain to be free from dust than that from most grasses. It is therefore looked upon as the standard of excellence, and usually sells for a higher price than any other hay in our markets.

Timothy requires a deep, retentive loam for its best growth. On such loams, with liberal top-dressing either with manures or fertilizers supplying abundance of nitrogen, it may prove quite persistent; but on the lighter soils and under less generous treatment timothy is likely to give way to inferior species within a comparatively short time. Just at the surface of the ground on a timothy plant which is mature will be found a considerable number of pointed and rather small solid bulbs. If these be fed off, or if the mowings be too much trampled by heavy animals, which doubtless crushes and bruises the bulbs to a considerable extent, the timothy will be seriously weakened. It is not, therefore, well adapted to grazing, and great precaution should be used in pasturing mowings in which timothy is the principal species.

Redtop.—Redtop, next to timothy, is our best-known grass. It reaches its most luxuriant development on deep, rich soils, and the best redtop that the author has ever seen in any part of Massachusetts was produced on the reclaimed salt marshes in the town of Marshfield. Redtop is a sod-forming grass, but the vigor of its underground stems is considerably less than that of some other species. Close observation has shown that redtop is capable of doing better in soils containing free

acid than most other species. Under ordinary conditions it is persistent. It will endure grazing much better than timothy. It starts slowly after having been cut, and usually produces very little rowen.

Rhode Island Bent and White Bent.—These species are very closely allied to redtop, and have the same general habit of growth. Indeed, it may be doubted whether there is a well-defined dividing line, based upon distinctions of practical importance, between these three species. There are doubtless differences which are sufficiently clear to the botanist; but it is at any rate true that the product from commercial samples of seed grown in plots side by side is so nearly alike in the case of these three species that so great an authority as Professor Lamson-Scribner, formerly agrostologist of the Department of Agriculture in Washington, has frankly admitted to the writer that he could distinguish no well-defined difference between them. It would seem, therefore, that, as the seed of redtop is more generally kept and better known, it must be unwise to purchase seeds of these other species which are less certain to be of good quality, and which are as a rule sold at higher prices.

Orchard Grass.—This is one of the best known among the less common grasses. It is a large, coarse species, and is one of the earliest to come into bloom. It has the very bad habit of growing in tufts, and is characterized by the production of a very heavy growth of foliage starting from the ground, and a relatively light production of stalk and seed. It is called orchard grass, not because it will grow better in the shade than when fully exposed to the sunshine, but because it will do better in the shade than most other grasses. If it can be established in light soils it will do better there than either the timothy or the redtop, and it is very persistent. In the writer's experience it has not seemed to yield to the pressure from any other competing species. It is often asserted that orchard grass is tough, woody or wiry; and, as this grass is frequently handled, this is undoubtedly true. This seems, however, to be due to the fact that it is not cut sufficiently early. It should not stand later than the period of very early bloom, and this stage is sometimes reached in this latitude as early as the 5th to the 10th of June. Few farmers are ready to begin haying at this time. Orchard grass deteriorates after blooming more rapidly than most species, and, as a consequence, orchard grass hay, often cut as late as the last of June, is of poor quality. Orchard grass starts quickly after being cut, but seldom comes into flower a second time during one season. Orchard grass rowen consists almost exclusively of very long, rather coarse leaves, springing from the ground; and, like the first crop, the rowen crop is not infrequently allowed to stand until these leaves have become in considerable measure brown or rusted, when it is somewhat inferior in quality.

Kentucky Blue-grass.—This species, known in some sections of the State as June grass, bears a general resemblance to redtop, although close inspection shows the two species to be in many respects quite different. Kentucky blue-grass produces a much larger proportion of leaves starting directly from the root than does redtop, and at the same time produces relatively far less stem and flower. It is also much earlier. Kentucky blue-grass has abundant underground stems, and in time forms a very close, velvety turf. It is one of the most valuable of pasture grasses, but is not a variety of the first importance for mowings, as there is little top. Kentucky blue-grass, further, has the very bad habit of producing relatively little second growth. In mowings it may be regarded as useful in filling in between larger and coarser species; but a mowing consisting largely of Kentucky blue-grass, while giving hay of excellent quality, is not likely to produce such quantity as to prove satisfactory to the best farmers. This species is best adapted to the strong, retentive soils, and reaches its highest development in the limestone regions of Kentucky and Ohio. On the

stronger soils in many parts of Massachusetts it is one of the most aggressive of species, and often in time comes to predominate almost to the exclusion of more valuable kinds. It flowers about with orchard grass.

Meadow Fescue and Tall Meadow Fescue.—These two species resemble each other so closely that they may be spoken of together, though one, as indicated by the name, commonly attains a considerably greater height than the other. These fescues are intermediate in coarseness between redtop and timothy. They produce abundant and vigorous underground stems, and are therefore aggressive and persistent species. They are best suited in strong, retentive soils, retaining considerable moisture, and in such soils the meadow fescue at least often comes in spontaneously. These grasses have a bright, clean foliage, unusually free from rust or blight, and form a very close turf. They produce abundant stem and flower, as well as leaf growth. It is the belief of the writer that farmers having soils of the kind indicated, and desiring mowings which shall be fairly permanent, will do well to give these grasses a trial.

In the paper of last year the results of a comparison of a mixture of seeds in which these species were prominent with another mixture in which timothy was most prominent in the first year after seeding were presented. Somewhat later in this paper the results of the continued comparison of the two methods of sowing in the second year will be given.

The fescues start quite quickly after being cut, and on good soils produce a fair amount of rowen. It is often stated that meadow fescue is especially well adapted for use in pastures; but an experiment in lawn-mowing this species, which it was believed would throw light on the question of its suitability for grazing, indicates that it will not endure such treatment. The lawn-mowed portion of a plot of meadow fescue in one of our experiments died out completely within about a year of such treatment, while the half plot handled as a mowing was still in perfect condition.

Sheep's Fescue, Red Fescue, Hard Fescue and Slender Fescue.—These species of the fescue order are very much smaller and finer than the two fescues which have been spoken of. They are sometimes recommended in works on grasses; but the writer has not been convinced, as the result of considerable opportunities to observe these grasses under different conditions, that they are ever likely to prove of value in mowings. They will thrive in lighter soils than many grasses, and are very persistent. In dry hill pastures they are of possible value, because of their ability to thrive under the conditions existing there. Under no circumstances is it believed these grasses should be included in mixtures for mowings.

Tall Oat Grass.—This grass will do better on the moderately light soils than many others. In such soils it is persistent, and will make a large crop in seasons when some other species fail. The seed is large, the young plants growing from it especially vigorous; and, as a consequence, this species will take possession of the ground and make a crop within fewer weeks after sowing than almost any other. Unfortunately the seed in the markets often shows a low percentage of germination, and the price at which it is held is high. Tall oat grass comes into bloom at about the same time as orchard grass, and is fairly suitable, therefore, for sowing with that grass. When the conditions as relating to farm work are such as to render it possible to secure a part of the hay crop exceptionally early, a mixture consisting largely of orchard grass and tall oat grass has much to recommend it for the lighter soils. It is asserted by some authorities that tall oat grass has a bitter flavor, which renders it unpalatable to animals; but the writer has observed no distaste for it on the part of any stock to which hay made from it has been fed. Tall oat grass starts quickly after cutting, and in favorable seasons will give three crops on rich soil.

Yellow Oat Grass. — This is a somewhat smaller and shorter species than the tall oat grass. It flowers at about the same season, and it is the belief of the writer that it is worth inclusion in mixtures made up chiefly of orchard grass. Unfortunately, as in the case of a number of the other less-known grasses, the seed often germinates poorly, and is held at a relatively high price.

Italian Rye Grass and Perennial Rye Grass. — These species of grass are said to be of the highest importance in Great Britain, and early writers upon the grass crop in America, copying to some extent from English books, frequently urged their cultivation. They seem to be less well suited to the drier climate of this country, with its more severe winters, than to Great Britain, and they are less hardy than most of our grasses. It is sometimes asserted that the perennial rye grass is much more hardy than the Italian; but, according to the writer's observation, there seems to be no great difference between the two species in respect to their ability to endure our winters. The seed of both varieties is relatively large. These species, therefore, make a quick start, and are capable of soon covering and occupying the ground. They are relatively early in coming into flower, and, while they are not sufficiently hardy to make it wise to depend upon them largely, it is the belief of the writer that a moderate amount of the seed of these grasses may wisely be included in mixtures composed chiefly of orchard grass, because of the contribution they will make, with a fairly favorable winter, to the product of the first one or two years, during which period they will help fill in between the larger and coarser orchard grass and other early species. If but one variety is to be tried for this purpose, the writer's preference would be for the Italian rye grass.

Awnless Brome Grass. — This species belongs to the same genus with some of the annual grasses which are regarded as troublesome weeds in some sections, and which are known by the names of chess, cheat, etc. It has very vigorous underground stems, and it is sometimes suggested that it may be difficult to get rid of it when the land is plowed. Experience on the Agricultural College grounds indicates this fear to be groundless. Awnless brome grass is an early-flowering species, and adapted, therefore, to sowing in mixture with orchard grass and other relatively early varieties. It inclines somewhat to the wiry habit of witch grass, but if cut early makes fairly palatable hay. It is the writer's opinion that the species has been much over-praised, and yet that it is worth trial by farmers occupying the lighter and drier soils.

Sweet Vernal. — This grass, also known as June grass in some sections, is characterized by the most delightful fragrance (especially after wilting) of any of our common species of grass. Much poetical license in reference to its influence upon the quality of dairy products has been based upon this fact. In plain prose, it must be stated that this is one of the least valuable of the species commonly found in mowings. It does not appear to be especially palatable to cattle, nor is it known to exercise any especially favorable influence upon the flavor of dairy products. This species comes into mowings on the lighter soils or in dry seasons on heavier soils, and gradually displaces the more valuable timothy and redbtop. There are two varieties, so-called perennial and the annual. The latter seems to have absolutely nothing to recommend it; while even the perennial sweet vernal should never, in the opinion of the writer, be included in mixtures of seeds for our mowings.

THE COMMON CLOVERS DESCRIBED.

There are but four clovers of recognized value in our mowings and pastures, — common red, mammoth red, the alsike and the white.

Common Red Clover and Mammoth Red Clover. — These species, which are in general well known, closely resemble each other in general habit. Between typical specimens of the two there are well-defined differences;

but the species seem to run together by insensible gradations, and the product of commercial samples of seed sold under the two names is often indistinguishable even by experts. The most important recognized differences between typical specimens are the following: the leaflet of the red clover is relatively broad, not very hairy, and has a whitish, approximately crescent-shaped mark on the upper surface. The leaflet of the mammoth clover is relatively narrow, elliptical, more hairy than in the common red, and is without the whitish mark. The mammoth clover is somewhat coarser and taller than the common red, and a little later in coming into flower. It is therefore looked upon as being somewhat better suited for use in mixture with timothy and redtop than is the common red, which is usually past the best stage of development for cutting before the timothy and redtop are ready. These clovers are rather short-lived perennials; but, as was pointed out in my first paper upon the hay crop, it is possible to produce hay in permanent mowings in which these clovers will be fairly prominent indefinitely, and that without reseeding; for a portion of the heads in the rowen crop are usually ripe before this crop is cut, and the seeds scattered from these heads constantly renew these clovers. As the older plants die, their place in the mowings is taken by the young plants from these accidentally scattered seeds. The persistence of these clovers in mowings, however, is dependent, as was pointed out in the earlier article, upon a liberal supply of the mineral elements of plant food, especially lime, phosphates and potash.

Alsike Clover. — Alsike clover is intermediate in its characteristics between the common red clover and white clover, having the erect habit of growth of the red clover, but the heads shaped like those of the white are in color pink, — a blending of the red and white. Whether alsike clover was originally produced as a hybrid between the red and the white is not definitely known. Alsike clover is of much value in mowings, especially upon the stronger and moister soils, where it is better than the common red. It is considerably finer than the red, and therefore cures more easily. It is of great value as a honey plant. According to the writer's observation, however, it does not persist as long as the red, neither does it produce as heavy a second crop. It should, however, be included in mixtures of seeds for the stronger and moister soils, where hay including clover is desired.

White Clover. — This well-known plant is not often included in mixtures of seeds for mowings. Its creeping habit of growth renders it rather unsuited to this use. It is, however, of much value in all permanent mowings, into which it comes naturally if the soils are adapted to it, and if the mineral elements of plant food are abundantly supplied. In such mowings it contributes largely to the product both in quantity and in quality. It is, moreover, the most valuable of the clovers for bees.

VARYING MIXTURES OF SEEDS FOR DIFFERENT PURPOSES.

In the first article on this subject three mixtures of seeds were given, and the conditions under which each should be used were briefly discussed. It was stated in that article that two of these seed mixtures were under careful comparison in the Experiment Station in Amherst.

The first of these mixtures, spoken of as the timothy mixture, was as follows: —

Per acre: —

	Pounds.
Timothy,	18
Redtop,	8
Mammoth clover,	5
Alsike clover,	4

The second mixture, spoken of as the fescue mixture, was as follows:—

Per acre:—	Pounds.
Timothy,	6
Redtop,	8
Kentucky blue-grass,	4
Meadow fescue,	6
Tall fescue,	4
Red clover,	5
Alsike clover,	4

These mixtures are under comparison upon a strong, retentive loam, under liberal use of manure and fertilizers. The seeds were sown in August, 1902. The crops in 1904 were respectively as stated in the first paper: for the timothy mixture, a yield in two cuts at the rate of about 5 tons to the acre; for the fescue mixture, also in two cuts, a yield at the rate of about 4½ tons per acre. Commenting on these results in the first article, I said: "The timothy mixture is in the first year plainly superior to the other, but it is expected that the fescue mixture will maintain its quality better." The yields during the last season seem so far to have justified this expectation. The average yield on the area sown to the timothy mixture in two cuts amounted during 1904 to 4 tons per acre. The average yield on the area sown to the fescue mixture is a very little greater than that amount. The first of the two mixtures of seed under comparison seems certain to prove most satisfactory where mowings are frequently broken up, but for more permanent mowings the second seems certain to prove superior on all the stronger and more retentive soils. A mixture adapted for permanent mowings on light soils was given in the first paper.

Other mixtures which may be valuable under the conditions indicated are the following:—

For two or three years' mowings on medium soils, per acre:—

	Pounds.
Orchard grass,	14
Tall oat grass,	6
Italian rye grass,	4
Meadow fescue,	6
Red clover,	6
Alsike clover,	2

For permanent mowings on medium soils, per acre:—

	Pounds.
Orchard grass,	8
Italian rye grass,	3
Yellow oat grass,	4
Meadow fescue,	5
Tall fescue,	5
Red clover,	5
Alsike clover,	4

Both of these seed mixtures will produce crops which should be harvested relatively early; and, unless the farmer is prepared to give them attention when the crop is in the best condition, he will do better to select a mixture made up chiefly of timothy and redtop.

The various methods of sowing grass seeds, the time of sowing and the use of manures and fertilizers in preparation for the hay crop were quite fully discussed in the first paper, which will be found in the May Crop Report for last year.

THE USE OF FERTILIZERS ON GRASS LANDS.

Top-dressing grass lands was discussed at some length in the first paper on this subject. The reasons were therein given why it is believed that on most farms manures should generally be used on the tilled fields. It was pointed out that in the decay of manures on the surface there is some risk of loss of their most valuable constituent, — nitrogen. It is equally true that in the decay of organic fertilizers, such as dried blood, dry ground fish or tankage on the surface there is danger of similar loss through the escape of ammonia into the air.

Nitrate of Soda for Mowings. — It seems to be the almost universal experience that nitrate of soda is the most valuable fertilizer which can be used for the purpose of increasing the growth of the grasses proper. Grasses make most of their growth in the early part of the season, and at a time when the conditions are not very favorable for the conversion of the relatively unavailable constituents of such fertilizers as sulfate of ammonia and the organic fertilizers which have just been mentioned into compounds suitable for plant food. Nitrate of soda, as is now generally known, is in condition to feed the crop just as soon as it is brought into solution, and relatively light rains will dissolve it and carry it into the soil. Nitrate of soda is, however, so soluble that there is quite a possibility that under some conditions it may be washed through the soil and lost before the crop can utilize it. This danger is undoubtedly less in the case of the grass crop than with most others, for the grass roots absolutely fill the soil, and the soil itself is in a relatively compact condition, — unfavorable to the rapid percolation of water. The writer has in a number of instances seen unmistakable evidence, in the second season following its application, of the beneficial effects of a heavy dressing of nitrate of soda. This observation, however, was made upon soils containing a large proportion of very fine particles, and therefore naturally compact and relatively impermeable. Even in the case of such soils, however, much care should be taken to apply nitrate of soda as near as possible at the time when the crop is ready to make use of it. It would be a mistake, especially in the case of the lighter soils, to apply nitrate of soda in early spring. It should be held until the weather is fairly settled and the grass is beginning to make considerable growth. In average seasons from about the 1st to the 10th of May will probably be found to give the largest increases in the crop. The quantity of nitrate of soda which may wisely be used in top-dressing mowings doubtless varies widely with soils. Wheeler finds that in Rhode Island applications running up to 300 or 350 pounds per acre prove profitable, and, indeed, that there is a larger profit from the use of such amounts than follows the use of smaller quantities. On some soils — and many of the fields of the college farm seem to have soils of this character — so heavy an application would usually prove inadvisable; it would render the crop likely to lodge. It has been found on the college farm that about 200 pounds per acre seem to be as large a quantity as it will pay to use. There must, of course, as will be at once understood, be a wide difference in the tendency to lodge under heavy nitrate manuring with the season, and no doubt also with the species of grass. In relatively dry seasons the heavy applications may prove useful, but in seasons characterized by frequent and sufficient rainfalls more moderate applications seem preferable. Wheeler has pointed out, as also have others, that the hay produced under heavy applications of nitrate of soda is richer in protein than that produced where less nitrate is used; but if the more liberal use of nitrate is followed by the lodging of the crop, the loss in quality due to the conditions existing must more than offset any gain due to the greater protein content.

Should Nitrate of Soda be used alone in Top-dressing Mowings? — In cases where a mowing is used in rotation for hoed crops, and where the

hoed crops receive comparatively liberal applications either of manure or general fertilizers, which supply phosphates, potash and perhaps lime, and where the production of hay, which it is desired shall consist chiefly of grasses such as timothy and redtop, for market is the object, it sometimes may be wise to top-dress with nitrate of soda alone. For one or two years it is possible as large an increase may be produced by the use of nitrate alone as by the use of nitrate combined with materials supplying phosphates and potash; but even in such cases considerable practical difficulty will be experienced in attempting to apply the nitrate evenly, and it would seem to be wise to use in connection with it some material which will keep it dry, which will dilute it, and which will therefore make it easier to distribute the nitrate evenly. In selecting a substance for this purpose, some material which is relatively low in price, naturally dry and fine itself, and which may be expected to ultimately benefit the condition of the soil, should be selected; and among such substances basic slag meal seems to be one which meets the requirements admirably. Imported slag meal can be sold in Massachusetts at about \$15 per ton. From 300 to 500 pounds in connection with nitrate in such quantity as will ordinarily be required, say 150 to 200 pounds, makes a mixture which will run through the fertilizer distributor evenly; while the slag meal, although not perhaps benefiting the immediate grass crop, will help correct a tendency to acidity in the soil, and will enrich it in phosphoric acid, which is fairly available.

With a view to maintaining the condition of the soil, it would seem to be expedient in most cases to combine with the slag and nitrate a moderate amount of some potash salt, for which purpose the high-grade sulfate will probably be found best adapted. On account of the expense connected with the use of slag and a potash salt in connection with nitrate, many are tempted, in view of the fact that the nitrate alone proves so largely beneficial to grasses, to depend exclusively upon this material. It should be clearly understood that nitrate supplies but one of the more important elements of plant food, and that continued dependence upon such one-sided manuring must therefore be unwise.

On the grounds of the Agricultural College is a plot of land containing about one-half acre, which for the last five or six years has been annually top-dressed with nitrate of soda alone. The mowing is one which has not been broken up for at least twenty years, and the prevailing species is Kentucky blue-grass. The product at the present time is exceedingly unsatisfactory. The grass during its growth shows a rather deep bluish-green color. Its growth is short, and it seems peculiarly liable to rust. Adjoining land of similar character, which six years ago was in the same condition as this half-acre, and which has been top-dressed with potash salts and slag meal in combination with nitrate, produces far heavier and more satisfactory crops. Nitrate alone, therefore, should be used for the grass crop only under exceptional conditions, and then not for many consecutive years. Two years will in most cases probably be the limit.

The Possibilities of the Hay Crop without Manures or Fertilizers supplying Nitrogen.—The fact that good crops of clover can be produced on land which for many successive years has received applications of materials furnishing of the different important plant food elements only phosphoric acid, potash and lime, was pointed out in the first paper upon this subject. In that paper the ability of clover to thrive on soils thus treated, due to the fact that it can take the needed nitrogen from the air, was especially emphasized. Attention is now called to the fact that good crops of mixed hay (clovers and grasses) can be produced under this system of manuring. A striking evidence of this fact is afforded by a number of plots on the grounds of the Massachusetts Agricultural College. It can readily be understood how good crops of clovers are possible under this system. It will not be equally clear, perhaps, to all how grasses which are known to take all the nitrogen

which they require from the soil can thrive on soils to which for a long series of years neither manure nor fertilizer furnishing nitrogen has been applied. That the grasses can do this, however, has been shown both at Amherst and by the work of numerous experimenters in other parts of the United States and in Europe.

The limed portion of one plot upon the Experiment Station grounds last season, which had been annually manured with dissolved bone-black and muriate of potash for fifteen years, and the greater part of the time at the rates respectively, bone-black 320 pounds and muriate of potash 160 pounds per acre, gave the following yields: hay, first cut, at the rate of 3,600 pounds per acre; rowen, second cut, at the rate of 2,575 pounds per acre.

Here was a total crop — and on soil, by the way, which is not typical grass land — at the rate of rather more than 3 tons per acre, at an annual fertilizer cost, covering the bone-black and muriate of potash, of about \$5.50 per acre. The land, however, has been limed twice during the fifteen years, at a cost for each liming of about \$6 or \$7 per acre. We have, then, an annual cost for lime at the rate of about \$1 per acre, making the total annual cost of the fertilizers used about \$6.50. For this small expenditure we have a crop in the fifteenth year of rather over 3 tons. In the same field we have a similar plot, to which the same quantities of dissolved bone-black, muriate of potash and lime are annually applied, and in addition nitrate of soda at the rate of 160 pounds per acre. Here the two crops last year amounted to 7,600 pounds of well-made hay. We have thus an increase of some 1,500 pounds of hay as the result of the employment of 160 pounds of nitrate of soda, which would cost about \$4. The use of the nitrate in addition to the bone-black and potash, therefore, is clearly profitable. It will be asked, however, Whence comes the nitrogen required by the grasses, where the dissolved bone-black, muriate of potash and lime annually are used? The answer undoubtedly is, From decaying clover roots and stubble. Clover thrives under this system of manuring. It draws nitrogen freely from the air. The clovers, however, are not long-lived plants. On their death and decay the nitrogen which had become a part of their tissues becomes available to the grasses which follow. By liberal use of phosphates, potash and lime, then, we can, if we will, in the first place produce heavy crops of clover and later heavy mixed crops of grass and clover, the grass feeding upon the products of the decay of the earliest clover plants. That this will prove the most profitable system of manuring does not follow, for, as indicated by the comparison above made, yet greater profit was consequent in the experiment under consideration from a combination of nitrate of soda with the other materials.

The Necessity for Lime. — The fact that an application of lime is frequently necessary in order to bring soil into such condition that clovers will thrive was particularly emphasized in the first article upon the hay crop. The results in the field which has been referred to very strikingly illustrate the same point. In this field there are two plots, which for the last fifteen years have annually received equal quantities of dissolved bone-black and muriate of potash. One in addition has received during the fifteen years two applications of lime at the rate of 1 ton per acre, — the first application, deeply disc-harrowed in, in 1899; the second application, put on as a top-dressing to the grass land, in the early spring of 1904. The product of the two plots was at the following rates per acre: —

Unlimed plot: —

	Pounds.
First cut,	860
Second cut,	280

Limed plot: —

	Pounds.
First cut,	3,600
Second cut,	2,575

The total product of the unlimed plot was at the rate of 1,160 pounds per acre. The total product of the limed plot was at the rate of 6,175 pounds per acre, or substantially five and one-half times the product of the unlimed plot. The grasses as well as the clovers made far more vigorous growth on the limed than on the unlimed plot.

Methods of applying Fertilizers.— In the relatively small amounts in which the concentrated fertilizer materials recommended are generally used, it is a matter of some difficulty, or rather one which requires an extreme degree of care, to apply evenly by hand sowing. There has been much inquiry for a machine which will apply fertilizers broadcast in a satisfactory manner. As a result of such experience as we have had here in the use of machines for this purpose, I conclude that our inventors have not as yet produced a machine which is altogether satisfactory. For the application of relatively small amounts of fertilizer we have for the last few years employed the Stevens' fertilizer distributor, and this, if kept in perfect order and all the working parts clean, is capable of doing fairly satisfactory work. The means whereby the amount of fertilizer applied can be gauged are not by any means perfect. It is difficult to set the machine for a definite amount, as the quantity of fertilizer feeding through it will vary widely with the condition of the material. A machine with a more certain and positive feed would be better. For the application of fertilizers such as lime or wood ashes, in amounts approximating a ton to the acre or more, we have used Kemp's manure spreader with the slow feed with fairly satisfactory results. It is relatively easy to apply definite amounts to given areas with this machine, but the fertilizer material is likely to drop in large masses occasionally, owing to not being reached and distributed by the beater; and, to avoid killing the grass in the spots where this happens, it is necessary to go over the field and scatter such fertilizer by hand.

THE CARE OF MOWINGS.

While great care is commonly taken in smoothing and leveling the surface when land is put into mowings, there is a tendency to unevenness, as the result of the action of frost and other agencies, and occasional rolling is likely to prove beneficial. In the case of the non-sod-forming grasses the condition of the mowing may be better maintained if some seed is occasionally sown. The reason why timothy in some cases proves much more persistent than in others is undoubtedly because the crop is harvested so late that some of the seed is mature before the crop is cut, and the seed thus accidentally scattered helps to thicken the mowing by producing plants which replace others as they die out. The best time for sowing such seed is either late summer or very early spring. The quantity of seed sown should be varied according as conditions seem to require. In case the stand of plants in a mowing is especially thin, and it is desired to reinforce it, it may be wise to go over the mowing either with a harrow or a weighted weeder after sowing the seed.

THE COMMON WEEDS OF OUR MOWINGS.

A considerable proportion of the mowings of the State are infested with weeds of different kinds. Among the most common and troublesome are the common white and the yellow daisy, wild carrot, sorrel, dock, buttercups, the common plantain, dandelions, milkweed, ragged robin and horsetail. The methods which will prove most effective in eradicating these weeds or keeping them in subjection must be quite

different in details for the different weeds; but in general it may be said that, if the soil is kept sweet by sufficient use of lime, and well enriched, the conditions will be made so favorable for the growth of the better grasses and the clovers that the weeds will have relatively little chance. The grasses and the clovers, in the struggle for existence which is always going on in the meadows, will prove victorious. There are localities, however, where certain weeds have gained such a foothold that special measures of eradicating them are called for. There is one general measure which may be expected to prove helpful in the case of almost any of them, which must be first considered. This is reseeding.

RESEEDING MOWINGS.

The question is often asked, when mowings become highly infested with different weeds, how these weeds can be best subdued or eradicated. Reseeding in almost all such instances, if carried out under the right conditions, is likely to prove helpful. The question will at once arise whether it is better to plow and cultivate for one or more years and then reseed, or to plow or otherwise break up the ground and immediately reseed. Experience in reseeding mowings in a field having a rather strong, retentive soil, which had become much infested with white daisy, buttercups, ragged robin and a few other species, convinced me that the best results are likely to be obtained by breaking up the land in midsummer, harrowing it repeatedly and most thoroughly until early in August, — so frequently and so thoroughly as to keep the surface absolutely free from vegetation, — then enriching liberally and reseeding, sowing seed in very liberal amounts. The seeds of most weeds, if buried in the ground too deep for immediate germination, retain vitality almost indefinitely, and the number of seeds which has been so buried in many of our soils is very great. Cultivation must be very long continued in order to permit the destruction of all such seeds. Every time we plow we are likely to bring a fresh lot of seeds near enough to the surface to enable them to vegetate. Cultivation must therefore be persisted in for a good many years, or it will prove relatively unimportant in its influence on the number of weeds which will start when at length the field is seeded. Conditions are most unfavorable for the germination and establishment of weeds in mowings if they be seeded early in August, after thorough preparation of the soil. Moreover, during the interval between plowing, which should take place early in July, and seeding, early in August, most of the weed seeds which lie near enough to the surface to germinate will have started, and the repeated harrowings above advised will have resulted in the destruction of the young plants as they start. When, after this treatment and after the thorough enrichment advised above, grass and clover seeds are sown, they make a quick and vigorous start, and the weeds gain but little foothold.

On the grounds of the Experiment Station mowings reseeded in this way are far clearer from weeds to-day than other mowings which were broken up and cultivated for a couple of years and then reseeded. It would, of course, be possible to give fields which have been cultivated such treatment as has been recommended in the case of mowings broken and reseeded without cultivation; but this would involve a greater loss of time, and would not seem to have any especial advantage. In the case of weeds starting from perennial roots only, such, for example, as witch grass, does a period of cultivation appear to be essential.

USE CARE IN PURCHASING GRASS SEEDS.

The seeds of several of the most troublesome of the weeds in our mowings are commonly found in commercial samples of grass and clover seeds, and a great deal of care should be used in the purchase of

such seeds to avoid samples containing the seeds of troublesome weeds in any considerable number. Among the weed seeds which seem to be most commonly mixed with commercial samples of grass and clover seeds are those of dock and sorrel, the yellow daisy, buttercup and plantain. Farmers may send samples of seeds to the Experiment Station for examination; but it would be a relatively simple matter for any farmer to collect a few seeds of these commoner and more troublesome weeds, and keep them for comparison with any foreign seeds which may be found in grass or clover seeds purchased. In this way, by the use of a magnifying glass of moderate power, the seeds of any of the weeds mentioned can be identified. By the exercise of care in the purchase of grass and clover seeds much trouble and expense may be saved.

The white daisy (*Chrysanthemum Leucanthemum*) may be practically eradicated from mowings without reseeding, by persistent early cutting, usually from June 12 to 15, and such enrichment of the soil as favors the growth of grasses. This plant is a biennial, and it is only necessary to prevent the ripening of seed.

The yellow daisy (*Rudbeckia hirta*) is not ordinarily troublesome save on light soils. Pulling the plants soon after they come into blossom will prove efficacious.

The wild carrot (*Daucus Carota*) is one of the most troublesome weeds in mowings, and has been allowed in many localities to ripen a tremendous amount of seed, so that the soil is thoroughly infested with it, and reploting will not be likely to prove effective. Timely cutting to prevent the ripening of the seed is a better preventative, and if persisted in for a few years the carrot will be eradicated.

Sorrel (*Rumex Acetosella*) is often prominent in new seeded mowings, but commonly disappears after one or two years. Its presence is an indication that the soil would be benefited by a liberal application of lime.

It seems to be impossible to procure grass and clover seeds entirely free from dock (*Rumex crispus*). The plants should be pulled after the stems become tough, but before the seed matures, which is best done after a rain, when the soil is soft. Hand-pulling is the method generally preferred, but there is no doubt that cutting the roots a couple of inches below the ground will destroy almost all plants.

Buttercups, common plantain, dandelions and ragged robin frequently become quite numerous in mowings, but are not hard to keep in subjection. Liberal use of fertilizers will so strengthen the grasses and clovers that these weeds cannot become very prominent.

Horsetail (*Equisetum arvense*) sometimes becomes very abundant in mowings, usually in soils that are rather sandy in texture, but have at the same time a fair capacity for holding water. Mowings that are badly infested should be broken up and reseeded, with thorough cultivation before seeding, as its presence in mowings is sometimes a source of danger to horses fed with the hay, it exerting a distinctly injurious effect when consumed in quantity, and sometimes causing death.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF JUNE, 1905.

SUPPLEMENTING THE HAY CROP.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON :
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE,
1905.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

CROP REPORT FOR THE MONTH OF JUNE, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., July 1, 1905.

Bulletin No. 2, Crop Report for the month of June, is herewith presented. At the close of this bulletin is an article on "How to supplement a short hay crop," by Prof. Charles S. Phelps, superintendent of Grassland Farms, Chapinville, Conn., and formerly professor of agriculture at Storrs Agricultural College. At the time when this article was arranged for, a light hay crop seemed inevitable, and, even with the improvement that must come from the recent rains, it would seem that information of this kind would be timely at this season. Professor Phelps has given a great deal of attention to grasses and forage crops, and the article will be found to be a particularly meaty and valuable one.

PROGRESS OF THE SEASON.

Preliminary returns to the Chief of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for June, 1905) on the acreage of spring wheat sown indicate an area of about 17,613,000 acres, an increase of 472,000 acres, or 2.8 per cent, over the estimate of the acreage sown last year. The average condition of spring wheat on June 1 was 93.7, as compared with 93.4 at the corresponding date last year, 95.9 on June 1, 1905, and a ten-year average of 94.4. The average condition of winter wheat was 85.5, as compared with 92.5 on May 1, 1905, 77.7 on June 1, 1904, 82.2 in 1903, and a ten-year average of 79.2.

The total area reported in oats is about 27,688,000 acres, an increase of 42,000 acres, or .2 of 1 per cent, over the area sown last year. The average condition of oats on

June 1 was 92.9, against 89.2 at the corresponding date last year, 85.5 in 1903, and a ten-year average of 90.1.

The acreage reported as under barley is less than that sown last year by about 172,000 acres, or 3.4 per cent. The average condition of barley was 93.7, against 90.5 on June 1, 1904, 91.5 at the corresponding date in 1903, and a ten-year average of 89.9.

The acreage under spring rye shows a reduction of 3.8 per cent from that sown last year. The average condition of rye was 93.6, against 86.3 June 1, 1904, 90.6 in 1903, and 88.9, the mean of the corresponding averages of the last ten years.

The total area planted in cotton is estimated to be about 28,120,000 acres, a decrease of about 3,610,000 acres, or 11.4 per cent, from the total acreage planted last year. The average condition of the growing crop May 25 was 77.2, as compared with 83 on May 26, 1904, 74.1 at the corresponding date in 1903, and a ten-year average of 85.3.

In Massachusetts the acreage of oats compared with that sown last year was given as 96, and the average condition June 1 as 88; the acreage of rye as 98, and the condition as 95; the acreage of clover as 97, and the condition as 81; the average condition of spring pasture as 78; the average condition of apples as 87; and the average condition of peaches as 88.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending May 29. — The week was warmer than usual in New England, the northern portion of the Middle Atlantic States, Florida, the lower Ohio valley and in the central and west Gulf States. Throughout the Pacific coast and Plateau districts, the Missouri and upper Mississippi valleys, and over most of the Lake region, the temperature was considerably below the normal. Over an area extending from northern Texas to South Dakota, including portions of Missouri and Wisconsin and the greater part of Iowa, the precipitation was excessively heavy. The rainfall over the South Atlantic and east Gulf States was also in excess of the average. In

the greater part of the Lake region, the Middle Atlantic States, New England, the Ohio and central Mississippi valleys, the precipitation was below the average, a considerable part of the Middle Atlantic States and New England receiving no appreciable amount.

Week ending June 5. — The week averaged cooler than usual in the lower Lake region, upper Ohio valley, Middle Atlantic States and New England, being decidedly cool over northern New England. From the South Atlantic and Gulf coasts northward over the central valleys and the eastern Rocky Mountain slope the week was warmer than usual, except over the southern portions of Alabama and Georgia, and northern Florida. There was more than the average rainfall in the central portion of the Middle Atlantic States and the upper Ohio valley, and from northern Wisconsin westward to the north Pacific coast. Generally throughout the central valleys, middle Gulf States, lower Lake region, and New England, the rainfall was below the average.

Week ending June 13. — The week was cooler than usual in the northern districts from the upper Mississippi valley eastward to the New England and Middle Atlantic coasts. In central and northern California, on the north Pacific coast, throughout the Southern States, and over the greater portion of the central valleys, the week averaged warmer than usual. With the exception of local showers, very little rain fell in the Southern States. There was less than the average amount over the southern part of the Middle Atlantic States and over portions of the Ohio, central Mississippi and Missouri valleys. In the Lake region and portions of the upper Mississippi, central Missouri and upper Ohio valleys, and over the northern portion of Middle Atlantic States and in New England, the rainfall exceeded the average.

Week ending June 19. — The week averaged warmer than usual in the central valleys, Lake region, Middle Atlantic States, the greater part of New England, and in the Southern States. The temperature was below the normal in the upper Missouri valley, over most of the Plateau districts and along the immediate Pacific coast, except in Washington and extreme southern California, where nearly normal conditions

prevailed. The rainfall of the week was very unevenly distributed in nearly all districts east of the Rocky Mountains. Throughout the Atlantic coast and Gulf States, areas of considerable extent, generally near the coast, received more than the average rainfall, while in other portions of the same district it was deficient.

Week ending June 26.—The week was warmer than usual in the Middle and South Atlantic States, the Ohio valley and portions of the lower Lake region. From the west Gulf coast and the Rio Grande valley northward and from the upper Lake region westward to the north Pacific coast the weather was cooler than usual, being decidedly cool in the upper Missouri valley and the northern Rocky Mountain region. In the Red River of the north and central Missouri valleys, and over an area extending from the west Gulf coast and lower Rio Grande valley north-eastward over the lower Mississippi and Ohio valleys and the interior of the Middle Atlantic States to the southern New England coast the rainfall was above the average. Over a large part of the Lake region, throughout the upper Mississippi and lower Missouri valleys and in northern New England the rainfall was below the average.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending May 29.—New England. Boston: First of week cold; frosts in interior and northern sections damaging tender vegetation and berries; week closed warm, with general need of rain; all vegetation backward, but improving; grass and oats good; rye heading short; much corn yet to plant; tobacco ten days late, but outlook favorable; apples below average; other fruit good.

Week ending June 5.—New England. Boston: Days seasonable, nights cool; much need of rain; frosts on one to three days, slight damage; grass not promising; vegetables improving; grain making slow growth; corn uneven; potatoes planted north, well advanced in south; apples good, but below average; other fruits promising; tobacco good, but much resetting necessary; insect pests numerous in south.

Week ending June 12.—New England. Boston: Low temperature, otherwise weather was favorable for crop growth; conditions improved; considerable replanting done; grain good; rye, oats and wheat heading in south; vegetables good, though much complaint of insects; grass improved, and outlook most promising; tobacco backward, but setting progressing well, and outlook good.

Week ending June 19.—New England. Boston: Weather very favorable; all crops improved, and progressing rapidly; grain good, corn especially improved; vegetables very good, but insect pests numerous; grass much improved, and haying will begin next week; apples good, but below average in quantity; other fruits excellent; tobacco nearly all set, and progressing rapidly.

Week ending June 26.—New England. Boston: weather favorable for crops, but too wet for work; weeds and insects troublesome; grain excellent; corn needs cultivation; grass improving, but some lodged, Hungarian being sown; near average hay crop expected; peaches large crop; apples below average; berries and vegetables good; potatoes excellent; tobacco good and growing well, setting nearly completed.

THE WEATHER FOR JUNE, 1905.

The weather during the first five days of the month was much the same that prevailed during the greater portion of May, the nights being cool, with only moderate day temperatures and little or no rainfall, which continued to accentuate the drouthy conditions prevailing so far this season. On the 6th these conditions were broken by a period of cloudy weather and general rains, which continued through the 8th, the rainfall amounting generally to between 0.8 and 0.9 inch. The temperature, however, continued low, and on the 9th was sufficiently cool to cause light frosts in some localities. Following the 9th the temperature became higher, with day temperatures ranging in the vicinity of 80°, and on the 16th and 18th rising to 90°, the nights also being seasonably warm, the temperature from the 10th to 18th ranging from 1° to 10° above normal. Fair weather with considerable sunshine also prevailed from the 10th to

the 17th, except on the 12th, when copious showers occurred, which further relieved the drouthy conditions and greatly benefited all vegetation. On the night of the 18th began a period of cloudy weather and almost continuous rain, which continued through the 22d. The rainfall was heavy, with amounts of 2 inches and more in all sections. This was the first period of general and heavy rains occurring for many months, and effectually removed the conditions resulting from absence of moisture, for the present. The temperature remained low during this time, but with clearing weather and sunshine from the 23d to the 26th rose to slightly above normal, and to maxima near 90° on the 26th. This warm period was broken on the afternoon of the 26th by a severe thunder storm of rain and wind, and in some sections of the eastern portion of the State accompanied with hail, which caused some damage to trees, buildings and grass. From the 27th to the end of the month moderate temperature and generally fair weather prevailed. Considering the month as a whole, the temperature averaged below normal, the rainfall much above normal, and the sunshine slightly below the usual amount.

In the circular to correspondents, returnable June 24, the following questions were asked: —

1. What insects are proving injurious in your locality?
2. How is Indian corn looking, and what is its acreage as compared with previous years?
3. Has haying begun, and what is the prospect for the crop?
4. Will the acreage of forage crops be increased in your locality?
5. How does the acreage of early potatoes compare with previous years, and what is the promise for the crop.
6. How do early market-garden crops compare in yield and price with former years, and what is the prospect for those not yet harvested?
7. How do the quantity and price of dairy products and the supply and price of dairy cows compare with former years?

8. What is the condition of pasturage in your locality?

9. What is the outlook for such fruits and berries as are grown for market, naming them?

Returns were received from 152 correspondents, and from them the following summary has been made : —

INSECTS.

Less damage from insects is reported than is usual at this season of the year. The only insect doing any unusual amount of damage is the cut worm, the various species of which appear to be unusually prevalent in all sections, doing the greatest damage in the tobacco-growing region. Potato bugs are the insect most commonly reported, but on the whole they appear to be less numerous than usual. Canker worms are reported by only 3 correspondents and tent caterpillars by but 10. The brown-tail moth is reported by 13 correspondents, from Cape Cod to the New Hampshire line. Other insects mentioned are squash bugs, currant worms, onion maggots, wire worms, horn flies, rose bugs, spittle insects, plant lice, the curculio and gypsy moth caterpillars.

INDIAN CORN.

Indian corn was reported as from a week to ten days late at the time of making returns, but of good color and growing fast. With warm weather and the recent rains it should soon make up the deficiency in growth. The early planted fields show poor germination and an uneven stand, owing to cold weather at time of planting, but later ones came well, have an even stand, and are but little behind the earlier ones in development. There appears to be a considerable increase in acreage over last year, when a small acreage was reported, though perhaps not more than an average area is under corn.

THE HAY CROP.

Haying had not begun at the time of making returns, except in isolated instances. The recent rains have greatly stimulated the growth of grass, and it is reported to be rapidly making up lost ground, due to cold and dry weather

in May. Many farmers seem inclined to wait for additional growth and to postpone haying, but it is a question if by so doing they will not sacrifice quality to quantity. Many will doubtless begin haying during the last few days of June, and by the 5th of July it should be well under way in all sections. Probably close to an average crop will be secured; certainly a much better yield is anticipated than was promised before the rains.

ACREAGE OF FORAGE CROPS.

Reports indicate that the acreage of forage crops will show a material increase for the State as a whole, owing to the anticipated shortage in the hay crop. Hungarian grass will be the principal crop sown for hay, with millet and fodder corn the leading soiling crops.

EARLY POTATOES.

There is no material change in the acreage of early potatoes for the State as a whole, but the returns indicate a slight decrease in central and eastern sections. There are numerous reports of poor germination, and the crop is uneven and rather backward. The recent rains and warmer weather should, however, bring it forward rapidly. It is too early to make any definite prediction as to the yield.

EARLY MARKET-GARDEN CROPS.

Early market-garden crops are generally reported to have yielded well. Prices appear to be on a somewhat lower level than usual, the principal complaints coming from the distinctively market-garden regions, where lower prices are of greater importance than elsewhere. With rains and warm weather the later crops promise well.

DAIRY PRODUCTS AND COWS.

The flow of milk has been well maintained, from all reports, and the amount of dairy products is therefore fully up to the average for the time of year. Milk generally brings the same price as last year, but butter and butter fat

command a higher level of prices than for some time, due undoubtedly to the scarcity of butter in the general market. Dairy cows are not as hard to obtain as formerly, according to the reports, and prices are a little easier, though good cows continue to command high prices and find a ready sale.

PASTURAGE.

Pastures were short and dry before the rains of the second decade of the month, but the heavy rainfall at that time and the frequent showers since then have improved them to a marked degree.. At time of going to press, pasturage was generally in remarkably good condition for midsummer.

FRUITS AND BERRIES.

Strawberries promised a good crop, but the frequent rains caused much decay, and it is doubtful if anything like an average crop was marketed for the State as a whole. The quality of the fruit, aside from softening from rain, was generally excellent, and prices have ruled strong. Raspberries and blackberries promise good yields, except in those sections where the vines winter-killed. Currants generally promise well. Cherries suffered somewhat from the wet weather, but have otherwise been an excellent crop. Plums and pears promise to give only light yields as a whole. Peaches set very well, and where the trees have come through the winters of 1902-03 and 1903-04 with sufficient vitality to mature a crop, there should be an unusually heavy yield for this section. Apples promise well for a non-bearing year, as it is in most sections, though at the time of making returns the "June drop" was not entirely completed. Wild berries promise well where reported on. A few scattered reports on cranberries show them to be blooming well. The recent rains have been remarkably beneficial to all fruits and berries, with the exception of strawberries.

NOTES OF CORRESPONDENTS.

(Returned to us June 24.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — Much damage is being done to gardens by cut worms. Corn came up rather unevenly, but is now of good color and growing nicely; good acreage planted. There is a large amount of clover this year, but the quantity of hay may be a little short. Only a moderate amount of forage crops is planned for. The prospect is now excellent for a large crop of potatoes. Peas are making good growth, and promise well, as do other garden crops. The supply of dairy cows is not large, and they command good prices; dairy products in full supply. So far this season the feed in pastures has been sweet and good. Blackberries blossomed full, and promise an abundant crop. On account of the difficulty of securing farm help, many farmers are keeping more and better horses, and are using improved machinery and implements.

Monterey (WM. S. BIDWELL). — Indian corn is looking well, with an acreage 10 per cent above the normal. Haying is just beginning, with prospect of a small crop. The acreage of forage crops will not be increased this year. There is about an average acreage of potatoes, and they are looking well. Dairy products and dairy cows are both higher in price than usual. Pasturage is in from fair to good condition. There are no fruits or berries grown for market except apples, and the prospect for them is good.

Alford (LESTER T. OSBORNE). — Insects are much less plentiful than usual, and are doing little damage. Indian corn is in about average condition. Haying has not yet begun; outlook for the crop better than formerly, but there will hardly be an average crop. The acreage of forage crops will not be increased. There is an average acreage of early potatoes, and the crop looks very promising. Prices for dairy products are so far a little better than last year's; price of cows about the same. Pastures have suffered from dry weather, but are improving. The outlook for apples is very poor.

Lee (ALONZO BRADLEY). — Potato bugs are doing some damage. Indian corn is looking well, and the acreage is fully up to former years. Haying has not yet begun; since the rains the crop has improved, and is now up to the average except on old mowings. There will be the usual acreage of forage crops this year. The acreage of early potatoes is fully up to former years, and the crop promises well. Dairy products and dairy cows show an advance in price. Pasturage is in good condition. Apples are dropping to a great extent, but a goodly number yet remain on the trees.

West Stockbridge (J. S. MOORE). — Potato bugs are doing a limited amount of damage. Corn is looking well, with about the same acreage as last year. Haying has not commenced, except on small fields of clover; good prospect for the crop. About the usual amount of forage crops will be put in. The acreage of early potatoes is about the same as usual, but the cold, backward spring has not been favorable to the crop. Dairy products and dairy cows both bring better prices than last year. Pastures are in good condition. The heavy frosts in May injured currants and berries, and some claim one-third of the apple crop was cut off.

Richmond (TIMOTHY B. SALMON). — Potato bugs are doing some damage. Indian corn is looking very well, with about an average acreage. Haying has not begun; the recent rains have improved the prospect, and there will probably be about an average crop. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, and the promise of a good crop. Dairy products are up to the average in quantity and price; small supply of cows for sale, and prices high. Pasturage is in good condition. Strawberries, raspberries, currants, pears and apples are all looking very well.

Hinsdale (THOS. F. BARKER). — No insects have appeared as yet, not even potato bugs. Indian corn is late and uneven, many having to plant over, on account of poor seed. Grass looks well, especially on good land. The acreage of forage crops will not be materially increased this season. There is about the usual acreage of early potatoes, and they show a large growth of vines. Early market-garden crops show fair yields, and later ones look well. Dairy products and dairy cows are fully up to the average in price. Pastures look well, and stock is doing well. Strawberries look finely, also blackberries; pears, apples and plums promise good crops.

Hancock (B. H. GOODRICH). — Potato bugs are doing some damage. Corn is very late, but of good color; acreage about the same as usual. Haying has not yet begun, but there will be fully an average crop. The acreage of forage crops will be slightly

increased. But few early potatoes are raised here, but they are looking well. Quantity and price of dairy products good; dairy cows sell slow, and at low prices. Pasturage is in excellent condition. Apples are less than an average crop, especially Baldwins; strawberries injured by frosts in blossoming period.

Williamstown (S. A. HICKOX). — No insects are doing damage as yet. Corn has made a good stand, but is late. Haying has not yet begun, but the recent rains insure almost a full crop. The acreage of forage crops will not be increased. The acreage of early potatoes is nearly up to former years, with a good crop promised. Dairy products are a little below last year in quantity. Pastures are in good condition. Strawberries promise well.

FRANKLIN COUNTY.

Rowe (N. E. ADAMS). — Squash bugs, potato bugs and tent caterpillars have appeared. Indian corn is rather poor, with a smaller acreage than usual. Haying has not commenced as yet, and there will be a light crop. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, and they are in fair condition. Dairy products are about the same as formerly in quantity and price, with cows \$10 higher. Pastures are in very good condition, considering the dry weather. Quite an average crop of wild berries is expected, but no berries are grown for market.

Colrain (ARTHUR A. SMITH). — Cut worms are doing some damage. Corn looks fairly well, though rather late; acreage 10 per cent more than usual. Haying has not begun, and there will be a light crop. The acreage of forage crops will be increased. There is a smaller acreage of early potatoes than usual, and a fair crop is promised. Dairy products and dairy cows are higher in price than formerly. Pasturage is in good condition. Apples bid fair to be an average crop; strawberries better than last year. A cold, dry May makes all crops about a week later than usual.

Leyden (U. T. DARLING). — Potato bugs are about the only insect doing damage. Corn is small for the time of year, with about the usual acreage. No haying has been done as yet; prospect very encouraging for a good crop. There is an increased acreage of early potatoes, and a good crop is promised. The acreage of forage crops will be about the same as last year. Dairy products sell well; not much change in price of cows from last year. The recent rains have improved the pastures very much. The outlook for strawberries and blackberries is good, and the same is true of small fruits.

Shelburne (GEO. E. TAYLOR). — Cut worms are doing some damage. Indian corn is looking well, and not much behind; acreage about the same as usual. Haying has not begun; quantity of the crop under the average but of good quality. The acreage of forage crops will not be increased to any extent. Acreage of early potatoes about the same as usual, and the promise of the crop good. Quantity of dairy products short; prices about the same as formerly. Pasturage is short, with the prospect of improvement. Apples short; also berries and currants.

Whately (FRANK DICKINSON). — Cut worms are doing some damage. Indian corn is looking well, with an average acreage. Haying has not begun, and the crop will be less than usual. The acreage of forage crops will be increased, principally corn and Hungarian grass. There is an average acreage of early potatoes, and the crop is looking well. Market-garden crops are late, but the prospect is good. Quantity of dairy products below the average; cows few and prices high. Pastures are short, but growing rapidly. The outlook for apples and berries is good.

Sunderland (GEO. P. SMITH). — Canker worms have appeared on some apple trees, and cut worms are working in tobacco. Corn is in normal condition, and the acreage is not much changed. Haying has not begun, and there will be a three-fourths crop. The acreage of forage crops will not be increased. Less potatoes are grown than usual, but they promise a full crop. Market-garden crops good, and prices good. Onions are making a good growth. Dairy products bring high prices; supply and prices of cows normal. Pastures have much improved since the rains. Strawberries good; other berries and small fruits promise well; apples light. Tobacco setting is finished, and the crop is starting well.

Northfield (T. R. CALLENDER). — Potato bugs and striped squash bugs are doing some damage. Indian corn is a little late, but there is a good stand, with about an average acreage. Haying has not begun, but the prospect for the crop is good. The acreage of forage crops will not be increased. Fully as many early potatoes have been planted as usual, but they came up poorly, and are rather uneven. Dairy products are dull at present, and the supply heavy; cows are a little off in price. Pasturage is in excellent condition since the late rains. Apples will be a light crop; strawberries fair.

Wendell (N. D. PLUMB). — Potato bugs and tent caterpillars are doing some damage. Corn is somewhat backward, but with the largest acreage for years. Haying is very backward, but there will be a normal crop. The acreage of forage crops will not be

increased. There is about the usual acreage of early potatoes, and the crop looks promising. Dairy products are normal in quantity and price, but cows are somewhat higher than usual. Pasturage is short, but the late rains have greatly improved it. Blueberries are a two-thirds crop; all fruits promise a large yield, except peaches and plums.

Orange (A. C. WHITE). — Cut worms are doing the most damage of any insect. Corn is small, but of good color, and with warm weather the prospect is good. No hay has been cut, and the crop will be light. The acreage of forage crops will not be increased. Early potatoes are normal in acreage and promise. Early market-garden crops are normal in yield and price. Cows are cheap. Dry weather greatly damaged early feed in pastures, but it is better now. Strawberries are a good crop; raspberries and blackberries winter-killed badly.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — Cut worms and potato bugs are doing some damage. Corn is looking well, but is a little late; acreage about as usual. Haying has not begun, and the crop will be very light, especially on dry soils. The acreage of forage crops will be increased perhaps 15 to 20 per cent. Very few early potatoes are grown. Quantity of dairy products a little off, owing to dry weather during the spring, and prices fully average; cows in good demand at \$30 to \$50. Pasturage is fairly good now, and growing better. Apples are about the only fruit to go to market in any considerable quantity.

Belchertown (H. C. WEST). — Potato bugs are the most common insect. Indian corn is looking fairly well, with acreage above previous years from 5 to 8 per cent. No haying has been done as yet, and the crop will be light, but is growing fast now. More forage crops are raised each year. Acreage of early potatoes above previous years, and looking finely. Quantity of dairy products light, but prices well up; cows plenty, and no higher. Pastures are extremely short. Apples promise poorly; pears fair; peaches set full; grapes full; berries and small fruits good.

Amherst (WM. P. BROOKS). — Some potato bugs and onion maggots have appeared. Indian corn is small and uneven, on account of imperfect germination; acreage about as usual. Haying has not begun, but there is prospect of an average crop. The acreage of forage crops will not be increased. Acreage of early potatoes about as usual, and the crop promises well and is now coming into bloom. Early market-garden crops are about average in yield and price. Cows are doing well where short pasturage has

been supplemented. Pasturage has been short, but the recent abundant rains have brought improvement. Strawberries are especially good; peaches, plums and apples promise well, though the latter did not set as well as usual.

Hadley (L. W. WEST). — Cut worms and wire worms are doing some damage. Corn is better than for the last three years, with a larger acreage. Haying has not begun, but the present prospect is good. The acreage of forage crops will be increased. Acreage of early potatoes about the same as usual, and the promise for the crop good. Early market-garden crops are about average in yield and price, and later ones promise well. Dairy products and dairy cows are about average in supply and price. Pastures are good at this writing. Strawberries are good, but late; blackberries winter-killed; raspberries, plums and currants promise well.

South Hadley (W. F. PERSON). — Potato bugs are doing some damage. Corn is looking well, with acreage about the same as last year. Haying has not begun, and the crop will be light, as it is heading out very short. The acreage of forage crops will be greatly increased. Acreage of early potatoes about the same as usual, and crop light. Market-garden crops are late, and prices firm. Dairy products are about as usual in quantity and price. Pastures are in poor condition, on account of the dry spring. Native berries are a failure; apples promise a one-third crop; cherries good; currants a failure.

Southampton (C. B. LYMAN). — Cut worms are doing damage in tobacco fields, and potato bugs have appeared. Indian corn is backward, but is looking fairly well; acreage about average. Haying has not begun, and there is prospect of a light crop. The acreage of forage crops will be slightly increased. Early potatoes are looking fairly well, with about the usual acreage. Quantity and price of dairy products fully up to the average; good cows scarce, and command good prices. Pasturage is in poor condition. There is a good crop of strawberries, and blackberries are in full bloom.

Williamsburg (F. C. RICHARDS). — Potato bugs are just appearing. Corn is backward, but looking well; acreage about the same as usual. Haying has not begun to any extent; crop good on good land, but light on poor land. I do not note any increase in the acreage of forage crops. The acreage of early potatoes is somewhat less than usual, but the crop is looking well. Quantity of dairy products about the same as usual, with prices rather better. Apples, peaches and pears are looking well, and promise good crops.

Chesterfield (HORATIO BISBEE). — Wire worms are the only

insects especially troublesome. Corn is a little small, but quite even. Haying has not begun; grass is backward, and there will be a fair crop a little later. The acreage of forage crops will not be increased. Early potatoes are looking well. Price and quantity of dairy products good; cows not plenty, and prices firm. Pastures are in good condition. Fruits and berries are not raised for market.

HAMPDEN COUNTY.

Chester (C. Z. INZELL). — Indian corn is looking well, and the acreage is a little larger than last year. Haying has hardly begun, and the crop will not be as good as that of last year. The acreage of early potatoes is about the same as usual, and they are looking very well. Pastures are looking well since the rains.

Blandford (EXOS W. BOISE). — Cut worms are numerous, and horn flies very troublesome. Corn is fully two weeks late, with a larger acreage than for several years. No haying has been done as yet, and the crop will be short except on good fields, not over three-fourths of the average. The acreage of forage crops will be increased, fodder corn, millet and Hungarian grass being the principal ones grown. There is about the usual acreage of early potatoes, and the recent rains will be the salvation of the crop. Dairy products amount to 90 per cent of the usual quantity, and prices are about as last year. Pasturage is poor and short. Few fruits and berries are grown for market.

Westfield (C. F. FOWLER). — Cut worms are very plenty in tobacco fields. Corn is looking well, with a full or enlarged acreage. Haying has hardly begun, with the crop 10 per cent below the average. There will be about the usual acreage of forage crops. Early potatoes did not come up well on dry ground, but an increased acreage and healthy growth will give a full crop. Dairy products and prices are a fair average with former years, with no extraordinary demand for dairy cows. Pastures are short, but feed is sweet where they are fully stocked. Strawberries are yielding fairly well; currants a full crop; cherries good; peaches, plums and grapes bid fair for good crops.

Agawam (J. G. BURR). — Potato bugs are doing some damage. Corn is looking pretty well, with acreage about the same as usual. Haying has not yet begun, and there will be a light crop. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, and the promise of a fair crop. Early market-garden crops have given the usual yields, with a fair prospect for later ones. Quantity and price of dairy cows are

about the same as in former years. Pasturage is short. The prospect is good for all kinds of fruits and berries.

West Springfield (T. A. ROGERS). — Potato bugs are doing some damage. The acreage of Indian corn is fully up to the average, and it is looking well, though ten days late. Nothing has been done to speak of in haying, and there will be an average crop. There will be something of an increase in the acreage of forage crops. The acreage of early potatoes is slightly increased, and they are looking well, but a little late. The weather was dry for early market-garden crops, but they are now looking well; prices about as last year. Quantity of dairy products full, and prices same as last year. Pasturage is very short, owing to dry weather. Apples, pears and peaches are full average crops; strawberries full crop; blackberries and raspberries doing well.

East Longmeadow (JOHN L. DAVIS). — Cut worms are doing a great deal of damage, and potato bugs are also prevalent. There is an average acreage of Indian corn, but a poor stand and a great deal of replanting. There will be increased acreage of fodder corn for forage. Potatoes are late; some fields look well, others uneven. Milk is about the same in price and quantity as last year; dairy cows more plenty. Pastures have been very poor, but should now start up. Frost hurt strawberries, and they are but half a crop; apples not set very full, owing to frost.

Wilbraham (H. M. BLISS). — No insects have appeared as yet. Corn is backward, and the acreage is perhaps slightly decreased. Haying has not yet begun, and the crop will be 10 per cent below the average. The acreage of forage crops will be increased. The acreage of early potatoes is slightly decreased, but the crop promises well. Early market-garden crops are fully up to the average in yield and price. Dairy products are fully up to the average in quantity and price. Pastures are in fair condition. The late rains have been very beneficial to the grass crop, potatoes and all kinds of fruit.

Palmer (O. P. ALLEN). — Few insects have appeared as yet. Indian corn is very backward, with the acreage about as usual. Haying has not yet begun, as grass is maturing later than usual. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, and the crop promises fairly well. Early market-garden crops are not up to the average. Dairy products and dairy cows are about the same as in former years in quantity and price. Pasturage has improved with the recent rains. The outlook for fruits and berries is fair.

Holland (FRANCIS WIGHT). — Indian corn is looking well, but

is a week or ten days late. Haying has not yet begun, but the prospect is fairly good if the farmers will wait for further growth. The acreage of forage crops will be fully up to other years. The acreage of early potatoes is about average, and they are looking well. The quantity and price of dairy cows will average about the same as in former years. Pastures are looking well, and feed is good. Apples, pears and peaches are below the average; berries not much raised for market.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — Cut worms are very plenty, and have done considerable damage. Indian corn promises to give an average crop. Haying has not yet begun, but the prospect is for a fair crop. The acreage of forage crops will be increased in our locality. Early potatoes are average in both yield and prospect. Dairy cows and dairy products are both average in quantity and price. Pastures are in fair condition since the rains of the past week. Strawberries and raspberries are a short crop; cherries a full crop; apples, peaches and pears set fairly well.

Brookfield (FRANK E. PROUTY). — Potato bugs are doing some damage. Corn is looking about average, with the acreage about the same as in former years. Haying has not begun as yet; prospect for about a two-thirds crop. The acreage of forage crops will be about the same as in former years. The acreage of early potatoes is fully up to the normal, and the crop looks well. Yield and price of early market-garden crops about the same as in former years. Butter has been higher than for several years; other dairy products fully as high as usual. Pastures are looking well now, on account of the recent rains. The dry weather of May and early June hurt the strawberry crop.

West Brookfield (MYRON A. RICHARDSON). — Cut worms are doing a great deal of damage in gardens and corn fields. Corn that was planted early is looking finely; acreage about as usual. Haying is backward, and old fields are thin and poor. The acreage of forage crops will be increased, mostly for use in the silo and to replace the poor pasturage. Potatoes are looking finely, but less were planted than last year. Butter is higher than for years; dairy cows plenty, and no demand. Pasturage has been poor and winter-killed in places, but looks better since the rains. Strawberries suffered from late frosts, but raspberries are in full bloom.

Barre (JOHN L. SMITH). — No insects are doing damage as yet. Indian corn is a little late, but is growing fast now. Haying has not begun, but there will be an average crop. The acreage of

forage crops will be increased. Early potatoes and market-garden crops are not raised to any amount. Quantity and price of dairy products and dairy cows about the same as usual. Pastures are improving rapidly since the rains. Apples promise a good crop.

Petersham (D. F. BIGELOW). — Yellow squash bugs and potato beetles are doing some damage. Indian corn is small, and needs cultivation; acreage about the same as usual. Haying has not yet begun, and there is prospect of a fair crop. The acreage of early potatoes is about the same as usual, and the crop promises well. Early market-garden crops are about average in yield and price. The acreage of forage crops will not be increased. Dairy products bring the same price as usual; dairy cows in easy supply. Pasturage has been poor, but must now improve. The outlook for apples is good.

Royalston (C. A. STIMSON). — Potato bugs and squash bugs are doing some damage. Indian corn is poor and backward, with the usual acreage. No haying has been done as yet, but there is a fair crop in prospect. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, but they have not made a normal growth. Butter is higher than formerly, quantity about average; dairy cows in good demand, at good prices. Berries promise to give good yields.

Winchendon (ARTHUR STOCKWELL). — Potato bugs are doing some damage. Corn is looking well. Haying has not yet begun. There will be about the usual acreage of forage crops. The acreage of early potatoes is about the same as usual. Early market-garden crops compare well with former years in yield and price. Dairy products and dairy cows are about the same as usual as regards supply and price. Pasturage is in fine condition. All kinds of berries will give good yields.

Gardner (A. F. JOHNSON). — Insects are not doing as much damage as usual, and no tent caterpillars have appeared. Corn is very late and small; no marked change in acreage. Haying has not yet begun; crop poor, but should improve in the next two weeks. There is no marked change in the quantity and price of dairy products, or the supply and price of dairy cows. Pastures have taken a new start since the rains came.

Princeton (A. O. TYLER). — Rose bugs and potato bugs are doing some damage. Indian corn is backward, but growing well now; acreage about the same as usual. Haying has not begun; there is a prospect of a fair crop since the rains, but not as heavy a one as that of last year. The acreage of forage crops will be a little increased. Early potatoes do not show quite as large an acreage as usual, but promise well. Dairy cows bring about the

same prices as usual. Pastures have been very dry, but look better since the rains. Raspberries, currants, grapes and cherries promise good crops.

Holden (CHAS. E. PARKER). — Tent caterpillars and potato bugs are the only insects as yet, and they are not numerous. Corn looks well, but is small for the time of year; acreage larger than usual. Haying has not begun, and the crop will be comparatively light except on the best-cared-for mowings. The acreage of forage crops will be increased, because of the hay crop promising to be light. Dairy cows are at least 25 per cent higher than a few years back. Pasturage is always poor in this locality. Strawberries are now doing well, and blackberries promise an abundant yield.

Northborough (JOHN K. MILLS). — Rose bugs, cut worms and onion maggots are doing some damage. Indian corn is looking well, but is somewhat late. There has been no hay cut as yet. There will be a full acreage of forage crops. There is about the same acreage of early potatoes as last year, and they are growing nicely. The yield of early market-garden crops has been good, with prices the same as last year, and later crops are looking well. Price of milk the same as last year, butter higher; plenty of dairy cows, with prices lower than last summer. Owing to the abundant rains, pasturage is in good condition. Strawberries, pears, plums, and grapes will be good crops, with some peaches.

Shrewsbury (FRED J. RICE). — Cut worms are doing some damage. Indian corn is looking rather backward, with about the same acreage as usual. Haying has not begun, and the crop will be rather light. The acreage of forage crops will be increased. Early potatoes are looking well. The yield of all forage crops is good, but prices have been low; later ones promise well. There is not much change as regards dairy products and cows. The rains have done pastures a great deal of good. The outlook for strawberries is good.

Worcester (H. R. KINNEY). — Potato, squash and rose bugs have been very plentiful, and cut worms are doing much damage on some fields. As a whole, corn is small, with about the usual acreage. Grass is very late, but seems to be growing well since the rains. The acreage of forage crops will not be increased if grass gives an average crop. There is about the usual acreage of early potatoes, and they look fairly well, though late. The yield for market-garden crops has been fair so far, but prices have been easy. Milk brings the usual price, and butter has been selling well. Pastures are in good condition for the time of year. Strawberries give promise of a rather light crop, and have rotted somewhat this week.

Blackstone (O. F. FULLER). — Potato bugs and cut worms are doing some damage. Indian corn is looking fairly well, but is a little backward. Haying has not begun, but will be commenced at once on some fields. The acreage of forage crops will be increased. There is the usual acreage of early potatoes, and they are looking well. Early market-garden crops are average in yield and price. Dairy products and dairy cows do not vary much from former years in quantity and price. Pastures are in fair condition. Very few berries are grown for market.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Potato bugs, rose bugs, cut worms, spittle insects and squash bugs are all doing damage. Indian corn is looking well, with about the usual acreage. Haying has not begun, but there will be a light crop. The acreage of forage crops will not be greatly increased. There is about the usual acreage of early potatoes, and they are looking well. Quantity and price of dairy products about the same as in former years, and cows are in normal supply and price. No cows are pastured in this vicinity. All fruits and berries look well, strawberries being the principal crop.

Marlborough (E. D. HOWE). — Potato bugs and brown-tail moth caterpillars are doing some damage. Indian corn is a good average crop, of about the usual acreage. Haying has not begun, and there will be about four-fifths of a crop. The acreage of forage crops will be somewhat increased. There is about the usual acreage of early potatoes, and the prospect for the crop is good. Peas and beans are very light crops; prices for early market-garden crops fair; prospect fair for later ones. There is less surplus than usual in dairy products, but prices are unchanged. Pasturage has improved since the recent rains, being rather short before. Strawberries and raspberries promise good crops; currants and apples fair; peaches a full crop.

Maynard (L. H. MAYNARD). — Canker worms have done some damage, and potato bugs and cut worms are as prevalent as usual; only a few asparagus beetles as yet. Corn is looking well, but is later than common; acreage about average. Haying has not begun; high lands will be light, but on medium and low land grass is catching up fast, and may be an average crop. The acreage of forage crops will not be increased. There is about the usual acreage of early potatoes, and, though the crop was slow in starting, it is looking well at present. Early market-garden crops are yielding well; prices about as formerly; good

prospect for a full crop of later sorts. Dairy products are in full supply, at fair prices; good dairy cows bring good prices. Pastures are looking unusually well at this time. Small fruits will give short crops; strawberries a good crop, but late and somewhat injured by rains; wild berries promise full yields.

Townsend (G. A. WILDER). — Tent caterpillars are not as plentiful as usual. Indian corn is normal both in promise and acreage. Haying has not begun, and the prospect is for a very light crop. The acreage of forage crops will not be increased. The acreage of early potatoes is about the same as usual, and they are looking well. Early market-garden crops are average in yield and price. Pasturage is in poor condition. Apples, peaches and small fruits promise full yields; strawberries late, but good size and quality.

Westford (J. W. THATCHER). — Indian corn is a good crop, with about the usual acreage. Haying has not begun, but there is prospect of a good crop since the rains. The acreage of forage crops will be somewhat increased. The acreage of early potatoes is rather above the average, and the prospect for the crop good. Dairy products are about the same as usual in quantity and price. Pastures are in good condition at present. The outlook for such fruits and berries as are grown for market is good.

Carlisle (E. J. CARR). — Cut worms and potato bugs are doing some damage. Corn came up well, and is now growing fast; acreage about the same as usual. No haying has been done yet, and there will be less than an average crop. There will be more forage crops planted than usual. The acreage of early potatoes is larger than last year, and they are looking well. Asparagus yielded well and brought good prices; other market-garden crops looking well. Dairy products bring higher prices than usual; price of dairy cows the same as last year. Pasturage has been poor all the spring, but is now very good since the rains. The frost injured strawberries; all other fruits look well. The brown-tail moth caterpillars are strongly in evidence.

Billerica (GEO. P. GREENWOOD). — Rose bugs, potato bugs, striped squash bugs, cut worms and wire worms are in evidence. Indian corn is not raised in this vicinity. Haying has not begun, but the crop will be good. Potatoes look well. The acreage of forage crops will not be increased. The yield of early market-garden crops has been light, but the prices good. Dairy products and dairy cows are both about normal in quantity and price. Pasturage is looking well since the rains.

Lincoln (C. S. WHEELER). — Brown-tail and gypsy moth caterpillars are doing damage, also potato bugs. Corn is backward;

acreage about as usual, but mostly raised for sweet corn and ensilage. Haying has just begun, with the prospect of about a three-fourths crop being secured. The acreage of forage crops will be increased. There is about the usual acreage of early potatoes, and the promise for the crop is fair. Asparagus is a three-fourths crop, but has brought good prices. Quantity and price of dairy products average; cows in better supply than latterly, and prices a little lower. Pasturage is only fair, but is improving since the rains. Apples will be about a one-third crop; peaches vary, perhaps a two-thirds crop; strawberries backward and few picked, but prices good; blackberries looking unusually well.

Winchester (S. S. SYMMES). — Cut worms, gypsy and brown-tail moths are doing damage. Haying has begun, and the crop will be fairly good. The acreage of forage crops will not be increased. Not many potatoes were planted, and they did not come up well. Prices on all garden crops except asparagus have been low. Quantity and price of dairy products about the same as usual. Pasturage is first class now, after the heavy rains. Peaches are a heavy crop; pears light; strawberries late, but good. The gypsy and brown-tail moth caterpillars have destroyed many orchards, and bid fair to finish about all the apple trees.

Stoneham (J. E. WILEY). — Brown-tail moth caterpillars are doing some damage. Indian corn is little raised hereabouts. Haying has not begun, and the crop will be light. The acreage of forage crops will not be increased. The acreage of early potatoes is about the same as usual, and the promise for the crop good. Prices for market-garden crops have been a little higher than usual, and the prospect is good for those not yet harvested. Feed in pastures is light at present.

Weston (HENRY L. BROWN). — Cut worms and squash bugs are doing some damage, and potato bugs are just hatching. Haying has not begun to any extent. There will not be much change in the acreage of forage crops. There is about the usual acreage of early potatoes, and they are looking well. The yield of early market-garden crops has been about average, but prices have been low. There is no change in regard to dairy products and dairy cows. Pasturage has been very short, but is better since the recent rains. Fruits and berries are all looking well.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Brown-tail moth caterpillars have done some damage, and now squash bugs and potato bugs are plenty. Corn is looking well, with an increased acreage. Haying has not begun, but there is prospect of a good crop.

There will be a small increase in the acreage of forage crops. There is about the average acreage of early potatoes, and they are looking finely. Early market-garden crops are about the same in yield and price as in former years, and later crops promise well. Milk is very plenty, with price holding the same; cows are about as formerly in supply and price. Pastures are good now, the late rains having brought them right up. The prospect is good for all kinds of berries; strawberries, raspberries and blackberries, also wild berries.

Amesbury (F. W. SARGENT). — Brown-tail moth caterpillars are more numerous than usual, and common caterpillars less so. Indian corn is backward, and below the average. Haying has not yet begun; prospect for the crop improved, and it is likely to be equal to last year. Dairy farms plant about the same acreage of forage crops every year. There is the usual acreage of early potatoes, and the crop is backward. Early market-garden crops are backward, and not likely to be up to the best condition. Prices of dairy products about average; good cows are bringing full prices, with few offered. Pasturage was poor the first of the season, but with frequent rains it is now favorable. Strawberries are a good crop; raspberries and blackberries promise well.

Groveland (A. S. LONGFELLOW). — There is very little damage from insects. Corn is rather backward, with a slightly decreased acreage. No haying has been done as yet, but the prospect for the crop is good. The acreage of forage crops will be somewhat increased. Acreage of early potatoes about the same as usual, but crop backward. Yield and price of early market-garden crops are fully up to the average. Pastures have been much improved by the recent rains. Peaches promise a good crop; apples fair; strawberries good.

Newbury (GEORGE W. ADAMS). — Brown-tail moth caterpillars, canker worms, potato bugs and tent caterpillars are all present. Indian corn is in very fair condition, but is late; acreage fully up to the average. Haying has not yet begun; prospect for a three-fourths crop, much better than ten days ago. There will be no increase in the acreage of forage crops. There is hardly an average acreage of early potatoes, but the promise is for a fair to good crop. This is about an average year for market-garden crops, except that they are all late. Quantity of dairy products excessive, and prices low; dairy cows cheap. Pastures are recovering from the drought, and are fairly good. Strawberries are late, and damaged by rain; other fruits about average.

Rowley (D. H. O'BRIEN). — Rose bugs, cut worms, brown-tail moth caterpillars, onion maggots and striped squash bugs are all

doing damage. Corn is looking very well; not as much planted as usual. Haying has not begun; it looks now like an average crop. The acreage of forage crops will not be increased. The acreage of early potatoes is a little larger than usual, and a good crop is promised. Market-garden crops and prices about normal, and prospect good for those not harvested. Dairy products are about normal; cows plenty, with prices lower than usual. Pasturage is in quite good condition. The outlook for early apples is good, and there are a few Russets and Baldwins; peaches light; cherries, plums and strawberries looking well.

Danvers (C. H. PRESTON). — Potato bugs are doing some damage. Indian corn is looking fairly well, with an average acreage. Haying has not begun, but there will be a fair crop. The acreage of forage crops will not be increased. Early potatoes are average in yield and promise. Early market-garden crops show a good yield and fair prices. There is a full supply of dairy products and dairy cows, with prices the same as last year. Pasturage is in good condition. The outlook for fruits and berries is good.

NORFOLK COUNTY.

Stoughton (CHAS. F. CURTIS). — Cut worms, rose bugs and potato bugs are troublesome. Indian corn is looking better than would be expected, with such cool weather; acreage about average. Haying has not begun, and is ten days late; prospect for about a three-fourths crop. The acreage of forage crops will be about the same as usual. There is a 20 per cent smaller acreage of forage crops than usual, but the crop promises well. Early market-garden crops are very late, yield fair and prices less than usual. Dairy cows maintain a level of from \$50 to \$65 for from fair to extra good animals. Pasturage has steadily improved with the rains. Strawberries will do very poorly, owing to frost and heavy rains.

Canton (E. V. KINSLEY). — Acreage of corn about the same as usual; crop late, but looking well. Haying has not begun, owing to dull weather; crop will be short. The acreage of forage crops will be somewhat increased, to make up for the short hay crop. The acreage of early potatoes is rather less than usual, and the crop is somewhat late and not very promising. Market-garden crops are late and rather light, and prices are unsatisfactory. The price of milk is the same as last year, and the supply has been full, but is falling short now; dairy cows have been plenty and prices lower than usual. Pastures are in fair condition. The present outlook is good for strawberries, apples and pears.

Westwood (HENRY E. WEATHERBEE). — Potato bugs and cut worms are doing some damage. Corn is late, and the acreage is smaller than usual. Haying has not commenced, but grass is looking well since the rains. The acreage of forage crops will be about the same as usual. There is not as large an acreage of early potatoes as usual, but the crop is looking well. Market-garden crops have not yielded as well as usual. Dairy products are in good supply, with prices about the same as last year. Pastures were poor until the late rains, but are looking better now. Strawberries are a good crop; currants looking well; grapes blossoming full; plums injured by frosts.

Norwood (Hon. F. A. FALES). — Rose bugs, squash bugs and potato bugs are doing some damage. Indian corn will be late, and must have warm weather soon; acreage about 75 per cent. Haying has not begun, but the prospect for the crop is much better than it was two weeks ago. The acreage of forage crops will be increased 25 per cent. The acreage of early potatoes is decreased one-fourth, but the crop is looking well at present. Early market-garden crops were a fair average in yield and price, and later ones promise well. The price of milk is the same as in 1904, but cows are rather higher. Pasturage is poor, but has improved with the rains. Strawberries are a very good crop; cherries suffered from the rains.

Walpole (EDWARD L. SHEPARD). Potato and squash bugs are doing some damage. Corn is looking well, but is late; acreage about the same as usual. Haying has not begun; prospect for a fair crop, though late. The acreage of forage crops will be increased. There is about the usual acreage of early potatoes, and they are looking well. Early market-garden crops were light, owing to poor germination. The price of milk is the same as last year; dairy cows scarce, and higher than in former years. With the rains, pastures are looking fairly well. Apples, pears, peaches and cherries look very well; also strawberries and blackberries.

Franklin (C. M. ALLEN). — Cut worms have done more damage than usual. Indian corn is backward, and came up poorly; acreage average. Haying has not begun, and the wet weather has brought the crop up to the average. The acreage of forage crops will not be increased. The rains have materially improved market-garden crops. There is no profit in the dairy business, and good cows are few and high. Pasturage is in very good condition. Strawberries, raspberries and blackberries are looking finely.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Currant worms,⁷ potato bugs, rose bugs and the curculio are prevalent, but none especially so. Acreage of Indian corn about the same as usual, but it is late and uneven. Haying has not begun; crop light on high ground, promising on lower. The acreage of forage crops will probably be about the same as usual. The acreage of early potatoes is about average, but the crop is late and weak. Very few market-garden crops in market as yet; prices about average. No marked change in any respect as to dairy products and dairy cows. Pasturage has been burned up, but is improving. Strawberries are not quite up to the mark; blackberries good; raspberries good; currants fair; grapes fair, but late; apples, pears and peaches medium.

Attleborough (ISAAC ALGER). — Not many insects have appeared as yet. Corn is looking well, with about the usual acreage. Haying has not yet begun, and there is prospect of a fair crop. The acreage of forage crops will not be increased. Not⁷ as many early potatoes were planted as usual, but they are looking finely. Early market-garden crops compare well with other years in yield and price. Dairy products and dairy cows are about normal in yield and price. Pasturage is in good condition. Strawberries are good; apples and pears have dropped badly.

Dighton (JAMES N. PAUL). — Cut worms and potato bugs are doing some damage. Indian corn is looking well, with a full acreage. Haying has not begun; there will be about a two-thirds crop. The acreage of forage crops will be increased. The acreage of early potatoes is not as large as usual, but the crop promises well. Not many early market-garden crops have been harvested, but they promise well. Quantity and price of dairy products about the same as usual. Pasturage is in good condition. The recent rains have caused both ripe and green strawberries to rot, so that there will not be half the crop promised in this section.

Swansea (F. G. ARNOLD). — Potato bugs and rose bugs are doing some damage. Corn is looking very well; acreage about the same as last year. Haying will not begin until after July 1; prospect for the crop good. The acreage of forage crops will not be increased. Acreage of early potatoes increased, but many fields are looking badly, on account of poor seed and dry weather at time of planting. Milk plenty, price same as last year; supply of cows equal to the demand, prices as usual, \$50 to \$60. Pastures are in very good condition. Strawberries are a fair crop, at good prices; apples, pears and peaches set well.

Dartmouth (L. T. DAVIS). — Potato bugs are doing some dam-

age. Corn looks very well, but is small; acreage much the same as usual. Haying has not begun, but the prospect for the crop is better than before the rains. The acreage of forage crops will be somewhat increased. There is not much change in the acreage of early potatoes, but many fields show a poor stand. Early market-garden crops are rather below average in yield, but prices much the same as usual; prospect fair for later ones. Dairy products are the same as last year in quantity and price; cows rather scarce and high. Pasturage is very fair since the rains, before which it was getting dry and short. Plums have not set well; apples fair; strawberries rotting badly; currants fair.

Acushnet (M. S. DOUGLAS). — Potato bugs, cut worms and maggots are working badly. Indian corn is very backward; acreage about average. Haying has not begun, and the prospect is good for a heavy crop. The acreage of forage crops will be increased. Early potatoes are fully up to the normal in acreage, but they rotted badly, and fields are looking very uneven. Early market-garden crops compare very favorably with other years in yield and price; prospect good for those not harvested. Dairy products are in full supply at good prices; cows are plenty and prices lower. Pastures are in good condition. Raspberries, strawberries, currants and blackberries will give good crops.

PLYMOUTH COUNTY.

Hingham (AARON LOW). — Cut worms are very plenty, and doing much damage. Indian corn is looking poorly, and did not come up evenly. Haying has not begun, and the crop will be rather light. There will be no increase in the acreage of farm crops. Early potatoes are a fair average acreage; rather late, but growing well now. Early market-garden crops are average in yield, but low in price. The quantity and quality of dairy products is about as usual. Feed in pastures is good, the late rains having started it well. Strawberries suffered from dry weather, and the recent rains have rotted them badly; plums and peaches promise well at present; apples fair; pears blossomed poorly and failed to set fruit.

Norwell (HENRY A. TURNER). — Currant worms, cut worms, rose bugs and potato bugs are doing some damage. Corn is late and small. Very little hay has been cut as yet; the late rains have improved grass, and there will be a fair crop. The acreage of forage crops will be increased very little, if any. There is about the usual acreage of early potatoes, and they are looking well, though a little late. Early market-garden crops were average

in yield and price, and later ones promise well. Pasturage is in very good condition. Strawberries are looking well, though some vines were winter-killed; apples promise a good crop.

West Bridgewater (CLINTON P. HOWARD). — Rose bugs are very troublesome. Corn is looking well, with an increased acreage. There will be a very light hay crop on all old fields, but a good one on those in good order. There will be no increase in the acreage of farm crops. The acreage of early potatoes is the same as last year, and they look very promising. Prices for market-garden crops rule higher than usual, but the cost of help increases. There is no change as regards dairy products; good market for milk at Brockton. Pastures never looked better. The late rains insure a large crop of fruits and berries.

Bridgewater (ROWLAND CASS). — Cut worms, potato bugs and squash bugs are doing some damage. Indian corn is looking well, with increased acreage. Haying has just begun, but the crop will be light. The acreage of forage crops is increased. The acreage of potatoes is considerably smaller than last year, with a great many missing hills. Market-garden crops are below the normal both in yield and price; prospect good for later ones. No change in the price of dairy products; cows lower than for some time. Pasturage is not up to the usual condition, although the late rains have helped it somewhat. Strawberries are the only small fruit grown for market of which there seems to be a fair average crop.

Plympton (WINTHROP FILLEBROWN). — Potato bugs, squash bugs and currant worms are doing some damage. Indian corn is late, but looks thrifty. The recent rains have postponed haying, and there will be a fair crop. The acreage of forage crops will be increased this year. There are not as many potatoes planted this year as usual. Market-garden crops and prices are about the same as usual. Dairy products bring about average prices. Pastures are improving every day. Apples are very promising, and cranberries will give a fair crop.

Curver (J. A. VAUGHAN). — Cut worms are doing some damage. The acreage of Indian corn is less than usual and there is never very much raised here. No grass has been cut as yet, owing to rains for past ten days; but it has made a rapid growth, and an average crop is promised. The acreage of forage crops will not be increased. Early potatoes are average in acreage and condition. But little early market-garden stuff is raised. The quantity and price of dairy products and supply and price of dairy cows is the same as usual. Pastures are in good condition. Strawberries are an average crop; cranberries are blooming well, where the

vines were not winter-killed, as most of them were on old, dry bogs.

Mattapoisett (E. C. STETSON). — Cut worms and potato bugs are doing some damage. Indian corn is looking quite well, with a larger acreage than usual. Haying has not begun, but there is prospect of an average crop. There will be about the usual acreage of forage crops. There is about the usual acreage of early potatoes, and they promise well. Early market-garden crops are a little better than the average, both in yield and price; prospect good for later ones. Quantity and price of dairy products about as usual; price of cows somewhat lower. Strawberries and currants are good crops.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Brown-tail moth caterpillars, currant worms and potato beetles are doing some damage. Corn is backward, with about the usual acreage. No hay cut as yet, and the prospect is for a normal crop on good meadows. There will be an increase in the acreage of forage crops. Acreage of early potatoes about the same as usual, but they came up unevenly, and show poor growth. Early market-garden crops are late; very few peas sold as yet. Pastures are good, as we have plenty of rain. Strawberries are a big crop; currants and gooseberries fair; red raspberries a full crop; early peaches about a failure, also plums.

Mashpee (W. F. HAMMOND). — Potato bugs and cut worms are doing some damage. Indian corn is below the average, with the usual acreage. Haying has not begun, but there will be about an average crop. The acreage of forage crops is above the average. Early potatoes are above the average, and promise to give a good crop. Early garden crops are above the average in yield and price. Quantity and price of dairy products about as usual; dairy cows bring good prices. Pasturage is in better than average condition. Gooseberries, currants, raspberries and strawberries all promise good crops.

Dennis (JOSHUA CROWELL). — Potato beetles and onion maggot are doing some damage. Indian corn is looking fairly well; acreage about the same as last year. Very little hay has been cut as yet, and there is the prospect of a fair crop. The acreage of forage crops will not be materially increased. There is no increase in the acreage of potatoes, but they are looking well. Dairy products and dairy cows are about the same as usual. Pastures are in very good condition. Strawberries are a medium crop; cranberries not yet in blossom.

Harwich (AMBROSE N. DOANE). — Tent caterpillars are doing some damage. Corn is looking finely; acreage about the same as in 1904. Haying has not begun, but we are looking for a good crop. There will be no increase in the acreage of forage crops. Acreage of early potatoes a little increased, and the prospect is good for a large crop. Quantity and price of dairy products about the same as usual. Pasturage was never in better condition. Apples will be a poor crop; cranberries about half a crop; strawberries a large crop.

Eastham (J. A. CLARK). — Acreage of Indian corn small, and crop rather backward. Very little hay has been cut yet, and the prospect for the crop has greatly improved recently. I do not think that the acreage of forage crops will be increased. There is about the usual acreage of early potatoes, and they are looking well. Quantity and price of dairy products and supply and price of dairy cows about the same as in former years. Pastures are in good condition. Asparagus is about the only crop yet marketed, and the season is nearly over; crop one-fourth short, and prices about as last year.

Wellfleet (E. S. JACOBS). — Squash bugs are doing some damage. Indian corn is looking well, with about the usual acreage. Haying has not begun as yet, but a good crop is expected. There will be no great increase in the acreage of forage crops. Potatoes are looking finely; acreage about average. Early market-garden crops are above average in yield, with prices about the same as last year. Quantity and price of dairy cows as in former years. The wet weather has greatly improved the pastures. Strawberries are not doing well, as they are rotting from the rains; other fruit looks well.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Cut worms and potato bugs are doing some damage. Indian corn is looking well, with an average acreage. Haying has not begun, but a good crop is in prospect. The acreage of forage crops will be about the same as usual. Acreage of early potatoes average, and the crop promises well. Dairy products and dairy cows are average in supply and price. Pasturage is in good condition. Strawberries promise well.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

HOW TO SUPPLEMENT A SHORT HAY CROP.

By Prof. CHARLES S. PHELPS, *Superintendent Grasslands Farms, Chapinville, Conn.*

Hay is so important a fodder in wintering all kinds of stock, that the indications of a probable shortage in the crop are always looked upon with considerable apprehension. The indications as to the probable yield are not very strong, however, until the time is past in which some of the best substitutes can be planted. For example, spring-sown oats and peas make a most valuable hay, but this crop should not be sown later than May 15 in Massachusetts. Nevertheless, there are quite a number of substitutes for the first crop of hay, which may be planted in June or July, which will make valuable forage. But, before considering special crops as substitutes for hay, it will be well to consider methods of handling the first crop so as to provide for a heavy second growth.

It will generally be noticed, on fields where there is any clover, that in dry seasons the proportion of clover is greater than in wet seasons. This is probably due to the fact that clovers will withstand the effects of drouth better than our common grasses. Fields with much clover on them should be cut early, so as to get the most possible good from the clover, and let the grasses growing with it be of secondary importance. This early cutting will encourage a vigorous second growth of both the clover and the grasses. A large crop of rowen may often be thus obtained. In order to assure a strong second growth, it is wise to apply some quick-acting fertilizer soon after the first crop is removed. The writer has found that 150 pounds of nitrate of soda per acre will give profitable returns in the second crop of hay. Most manufactured fertilizers which contain a large proportion of quick-acting forms of nitrogen should give good results when used in this way. Fine and well-rotted stable manure, while not as active as most chemical fertilizers, will often pay in the increase of rowen, when spread on the grass lands shortly after the first crop is removed.

Another method of obtaining a good second crop, where it is desirable to keep the field in permanent mowing and the soil is badly "run down," so that very light yields are obtained, is to cut early and plow and seed at once to clover and mixed grasses, using at least 15 pounds of clover seed per acre. Where the seeding is done early in July, a good crop of clover should be obtained late in September or early in October, and a strong growth of grass and clover will follow for the next year.

In selecting crops for growing late in the summer and during the fall an effort should be made to grow those that will be substitutes for hay or for corn silage during the fall and early winter. Green fodders for late fall feeding are valuable, in place of the scanty pasturage common at this time; or, after the ground is frozen, field-cured corn fodder is nearly equal to silage or good hay. Dried corn fodder will generally be much better eaten and relished in the late fall or early winter than if kept till late in the winter, while the corn silage or hay will retain its full value through the winter.

CORN.

Of the annual forage crops adapted as substitutes for common hay, perhaps corn fodder is one of the best. Corn is a crop suited for growth on nearly all soils, and, with the many varieties to select from, kinds can be found that may be planted as late as July 10, that will give a fair growth of fodder. For late planting some of the large-sized sweet corns are the best. Frequently a good crop of sweet corn for the market may be had if the crop is planted early in July, while the fodder and smaller ears will be available as forage. This may be fed green, or, if damage from frost is expected, it may be dried and fed in place of hay.

HUNGARIAN GRASS AND THE MILLETS.

Of the annual crops adapted for hay, probably the Hungarian grass and the various kinds of millets are the best. The Hungarian grass makes a lighter and finer growth than the millets, and is to be preferred for hay; while the millets are better if green fodder is wanted. Hungarian grass tends to send up its blossom heads at an earlier stage of growth when sown late, and a shorter and lighter growth will usually be obtained if the seeding is deferred until after July 1. This can be overcome, in part, by having a well-fertilized or well-manured soil, with plenty of quick-acting nitrogen. Hungarian grass should always be cut early, even before all the heads are fully formed, as it rapidly becomes tough and woody after it passes the early blossoming stage. Of the mil-

lets, the Japanese and the golden millets are probably the best. These may be grown for hay, but make a rather coarse fodder. They should be grown on rich soil, and be seeded at the rate of not less than $\frac{1}{2}$ bushel per acre. When grown thickly and cut before the heads are fully formed, the millets will make a fairly good grade of hay. Most dairymen, however, find them more valuable for green fodder than for hay. Even when used for green fodder, thick seeding and early cutting are desirable, in order to avoid the stems becoming woody, so that stock does not eat the fodder readily.

SOY BEANS.

Soy bean fodder is a crop which has been strongly recommended for growing in New England, and it is worthy of careful trial. The writer has had fifteen years experience with this crop in Connecticut, and has seldom had a failure. In years when corn can be grown to maturity, this crop will usually ripen its seed. If wanted for its seed, it should, of course, be sown early, not later than June 15; but for feeding green or for silage it may be sown as late as July 10. As this is a bean-like plant, it should be sown in drills and cultivated, and never be sown broadcast unless wanted for green manuring. One bushel of seed per acre has been found to be a good rate of seeding when growing the crop for fodder. The seed may be planted in any of the common corn planters, or drills may be opened with a marker, and the seed be sown by hand and be covered with a plow or a wing-toothed cultivator. The crop may be harvested for silage, or be fed green. When used for silage it should be placed in the silo in layers with corn. Two loads of corn to one load of the soy beans makes a good mixture. Soy bean silage, when preserved alone and fed separately, has been known to cause a disagreeable flavor in milk and butter; but when the mixture of two-thirds corn and one-third soy beans has been fed in the form of silage, no bad results have been noticed. Soy bean fodder may be fed green for three to four weeks in September, providing frost does not injure it. No bad flavors are known to occur in milk or butter from the crop when fed in the green state. When used as a green fodder, the feeding should commence as soon as the crop begins to blossom, for the stems of the plants become woody soon after seed develops.

Poor success will often be had with this crop until the soil becomes inoculated with the special bacteria which produce the nodules on the roots of soy beans. This inoculation may be accomplished by treating the seed with the pure cultures now offered for sale by reliable dealers; by getting soil from an old soy bean

field, where the nodules have been abundant on the roots of the crop; or by getting the dried nodules from the roots of a crop, and saving them over until another year. This last method may be carried out by pulling a part of the crop where the nodules are plentiful, and when the fodder is well dried, shaking the dirt and nodules adhering to the roots onto bran sacks, and then saving this material over winter for use in treating the seed for another crop. By mixing this dry material with the seed just before it is planted, the crop will become inoculated quite early in its growth, and more completely so than where soil inoculation is practised. The most common method, however, is to dig about 1,000 pounds of surface soil from an old soy bean field, and use it broadcast on the new field, harrowing it in before planting the seed.

OATS AND PEAS.

Oats and Canada field peas, which so many find valuable for summer feeding and for hay when sown early in the spring, may also be grown as a fall forage. This crop can be sown in July on fields where rye has been harvested, or after early-cut grass. The peas should be plowed under rather shallow, at the rate of $1\frac{1}{2}$ bushels per acre, or else be deeply harrowed in with a wheel harrow; while the oats should be sown at the same rate, and be lightly harrowed in. This crop may be fed green, or in many seasons, when grown on rich soil, will make a valuable hay for harvesting early in October.

BARLEY AND PEAS.

Barley and peas is another forage crop valuable for fall feeding. It has advantages for late forage not possessed by oats and peas. While oats are damaged by heavy frosts, barley will remain vigorous and continue to grow until early in November. This makes the barley and peas valuable for late soiling purposes or for pasturing. The barley and peas should be sown at the rate of $1\frac{1}{2}$ bushels of each per acre, and the crop may be sown as late as the first week in August. We have used this crop for soiling purposes as late as the middle of November. Some farmers have had poor success in growing the peas when sown in the summer. Where this is the case, the oats or the barley may be grown alone, and will produce good crops when seeded at the rate of $2\frac{1}{2}$ or 3 bushels per acre.

WINTER VETCH.

A valuable fall forage crop which may be grown for pasturage is winter vetch. This may be grown alone, or with winter wheat. This combination has been grown more commonly as an early spring

soiling crop; but, if planted as early as July 20, a heavy growth of both wheat and vetch may be had for fall feeding. This crop makes a rich pasture feed, or it may be cut and fed as a soiling crop. If pastured and not fed very closely, enough will usually be left over winter to furnish feed for pasturing or soiling in the early spring. The vetch seed is quite expensive; but, as the seeds are small, $\frac{1}{2}$ bushel per acre will suffice for a good seeding, when used with 2 bushels per acre of wheat.

RAPE.

Rape is a turnip-like plant, which often grows 3 to 4 feet tall. It is quite commonly grown in the more northerly countries of both Europe and America as a feed for sheep. This may also be grown as a late fall fodder for feeding to young stock or to dry cattle. We would not advise its use for dairy stock producing milk, unless in quite small quantities, because of the danger of producing a disagreeable flavor in the milk and butter.

CABBAGE.

Late cabbage is a crop which can often be grown with profit by dairymen as a market crop, and the unmarketable portion will furnish valuable fodder. * Retail milk dealers, with routes in the smaller cities or in towns and villages, may often find a ready retail market, at a good profit, among their customers for all the larger and better heads of cabbage, leaving only the poorer heads and the leaves as fodder; or cabbage can usually be shipped to the larger cities, and sold at wholesale, finding a ready market at a fair profit. This crop, however, may be an economical one to grow even when raised entirely for stock feeding. The plants may be set as late as the middle of July, and still make a heavy growth of firm heads. To get the best results, the soil should be made rich with well-rotted stable manure. Cabbage is not injured by heavy frosts, and that portion of the crop not fed before the ground freezes may be stored in piles, covered with leaves or straw, and be fed during the early winter.

APPLES.

In seasons when there is a large crop of apples, these may be fed to advantage. The poorer kinds of fruit, and that which is not of a high enough grade to sell as market fruit, can often be fed to dairy stock with good results. Stock soon become accustomed to the fruit, so that the amount fed may often be increased to 3 pecks or more per day, by starting with a peck per day.

Apples should always be fed in the mangers rather than in the field, so that if choking occurs, the condition may be more readily discovered and relief afforded.

In some localities apple pomace may be regularly obtained from the cider mill, and this has been found to be valuable feed for milch cows. One of the most successful dairymen in Connecticut uses this feed regularly during the fall months. At first it was obtained for the hauling, but others soon perceived its value, and the demand became so strong that the price advanced to \$1 per load.

This feeder considers it nearly equal in feeding value to corn silage. When silo space is available, apple pomace may be stored in the silo, making a valuable winter fodder. During the rush season at the mills it can often be obtained in larger amounts than the herd will consume from day to day, and if preserved in the silo, a supply may be provided for many weeks ahead.

FEEDING THE HAY.

When all has been done that can readily be done to supplement a short hay crop by growing substitutes on the farm, something may also be accomplished by exercising good judgment in feeding the hay. Many have the impression that milch stock should be fed all the coarse fodder they will eat. This we believe to be unnecessary, and contrary to the teaching of some of the more recent experimental work done by the experiment stations. The more palatable and the more easily digested the ration of a milch cow is, the better. To obtain the best results, about one-half of the dry matter of the ration should come from the grain feeds. This means that grain feeds should constitute a large part of the total feed of the cow. If a considerable part of the coarse fodder of the ration comes from the silage, only a small part need be provided in the form of hay. The cheaper dry fodders, such as corn stover or oat straw, may be fed in connection with liberal silage and grain feeding, and good results will follow.

Recent experimental inquiry has shown that the value of a feed depends quite largely on the ease with which it is digested. It was formerly supposed that a pound of digestible dry matter from one source was just as valuable as a pound from another, but this supposition has been overthrown by recent experimenting. The energy or labor required in digesting a certain feed must come from the food eaten. If the food eaten is largely coarse, dry fodders, more energy will be required in the work of digestion, and less will be left for building up valuable products, than where the

feed is mainly easily digested materials, such as succulent fodders or ground grains. For the same reason, the older and tougher the fodder is when harvested, the greater will be the labor of digestion. Some German experiments have shown that from 10 to 12 per cent of the total energy of certain coarse, dry fodders was used up in the labor of digesting the fodder.

It may thus readily be seen that the extensive feeding of coarse, woody fodders is a severe tax on the total energy of the ration in the work of making the food nutrients available. It follows, then, that a ration made up largely of grains and ensilage and early-cut hays, with only a small proportion of coarse or late-cut dry fodders, will furnish a larger proportion of available energy than a ration composed quite largely of coarse, dry fodders. This helps to explain why the exclusive or heavy feeding of late-cut coarse fodders to milch cows is not generally profitable.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF JULY, 1905.

BUSH-FRUITS.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON :
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1905.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

CROP REPORT FOR THE MONTH OF JULY, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Aug. 1, 1905.

Bulletin No. 3, Crop Report for the month of July, is herewith presented. Attention is called to the article on "Bush-fruits," at the close of the bulletin, by Prof. F. S. Card, professor of horticulture at the Rhode Island College of Agriculture and Mechanic Arts, and an authority upon the subject. The article deals exhaustively with the propagation, selection and management of these fruits, and will be found of interest to almost all readers, if only for a fuller knowledge of their possibilities in the garden.

PROGRESS OF THE SEASON.

Preliminary returns to the Chief of the Bureau of Statistics of the Department of Agriculture show the acreage of corn planted to be about 94,011,000 acres, an increase of about 2,080,000 acres, or 2.3 per cent, on the area planted last year. The average condition of the growing crop on July 1 was 87.3, as compared with 86.4 on July 1, 1904, 79.4 at the corresponding date in 1903, and a ten-year average of 87.6.

The average condition of winter wheat was 82.7, as compared with 85.5 a month earlier, 78.7 in 1904, 78.8 at the corresponding date in 1903, and a ten-year average of 77.8. The average condition of spring wheat was 91, as compared with 93.7 a month earlier, 93.7 in 1904, 82.5 in 1903, and a ten-year average of 89.3. The average condition of spring and winter wheat combined was 85.8, as compared with 84.5 on July 1, 1904, and 80 at the corresponding date in 1903. The amount of wheat remaining in the hands of farmers was estimated to be about 24,257,000 bushels, equivalent to about 4.4 per cent of the crop of last year.

The average condition of the oat crop on July 1 was 92.1, as compared with 92.9 a month earlier, 89.8 in 1904, 84.3 in 1903, and a ten-year average of 88.5.

The average condition of barley was 91.5, against 93.7 a month earlier, 88.5 in 1904, 86.8 the previous year, and a ten-year average of 88.3.

The average condition of winter rye was 92.7, as compared with 88 on July 1, 1904, 90.2 at the corresponding date in 1903, and a ten-year average of 89.1. The average condition of spring rye on July 1 was 93, as compared with 90.8 in 1904, 88.3 in 1903, and a ten-year average of 88.4.

The acreage of rice is less than that of last year by about 172,000 acres, or 26 per cent; and the condition on July 1 was 88, against 88.2 a year ago.

The acreage of flax is greater than that of last year by about 128,800 acres, or 6.7 per cent; and the condition on July 1 was 92.7.

The acreage of potatoes, excluding sweet potatoes, is less than that of last year by 19,000 acres, or .6 per cent. The average condition was 91.2, as compared with 93.9 in 1904, 88.1 in 1903, and a ten-year average of 92.1.

The acreage of tobacco is less than that of last year by about 54,000 acres, or 6.7 per cent. The average condition on July 1 was 87.4, against 85.3 a year ago.

In Massachusetts the acreage of corn compared with that of last year is 101, and the average condition July 1 was 92; the average condition of oats was 98; the average condition of spring rye, 97; the acreage of potatoes, 99, and the average condition, 92; the acreage of tobacco, 101, and the average condition, 92; the average condition of clover, 93; the average condition of timothy, 86; the average condition of pasture, 91; the average condition of apples, 78; the average condition of peaches, 86; the average condition of grapes, 80.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES WEATHER-CROP BULLETINS.]

Week ending July 3. — The week was cooler than usual in all parts of the country, with the exception of the east Gulf States and portions of the south-eastern Rocky Mountain slope and southern Plateau region. The rainfall of the week was excessively heavy in the States of the Missouri

and upper Mississippi valleys, in the lower Ohio valley, and over the greater part of the Gulf States. There was more than the average precipitation in northern New England and over limited areas in the Middle Atlantic States and Lake region. The rainfall was below the average in most of the Lake region, the Atlantic coast districts south of New England, in the upper Ohio valley and on the central Gulf coast.

Week ending July 10. — The week was warmer than usual in the Pacific States, the Plateau district, and from the lower Lake region and New England southward to the Carolinas. From the eastern Rocky Mountain slope eastward to the upper Lake region, central Ohio valley and the east Gulf States the week was cooler than usual. The rainfall was decidedly heavier than usual over much the greater part of the country east of the Rocky Mountains, being excessively heavy over a large part of the Lake region. In New England and along the immediate Middle Atlantic coast the rainfall was below the average, only inappreciable showers occurring in southern New England, with a total absence of rain along the northern coast.

Week ending July 17. — The week averaged warmer than usual in the Atlantic coast States northward of the Carolinas, in the upper Ohio valley, lower Lake region, and from the northern portion of the upper Mississippi valley westward to Idaho. In the southern States and over most of the central valleys and the Lake region the week was cooler than usual. Over a large part of the Middle and South Atlantic States and much of the Lake region and Ohio valley the rainfall was heavier than usual. The rainfall was also heavier than usual in portions of the Dakotas and over limited areas in the upper Mississippi and Missouri valleys.

Week ending July 24. — The temperature of the week averaged warmer than usual over the country east of the Mississippi, south of northern New England. It was cooler than usual throughout northern New England, the upper Missouri valley, the Rocky Mountain slope and southern Plateau region. The rainfall was heavier than usual over

New Mexico, northern Texas, Louisiana and southern Mississippi from southern Missouri eastward to the Atlantic coast and in the upper Lake region. The rainfall was deficient over the Missouri and upper Mississippi valleys, lower Lake region and New England.

SPECIAL TELEGRAPHIC REPORTS.

Week ending July 3. — New England. Boston : Weather favorable, except nights too cool; too wet early part of week; sufficient moisture for present needs; grain heading, indications good; corn backward, but color and stand good; grass average, with haying under way; vegetables above average; apples below average and dropping; potatoes excellent; tobacco good.

Week ending July 10. — New England. Boston : Weather favorable for crops and for farming operations; grain good; corn has made rapid progress; grass good and haying well under way; fruits promise well, except apples, which are below the average and falling badly; field and garden vegetables excellent; potatoes blossoming, with decidedly good outlook; tobacco showing well.

Week ending July 17. — New England. Boston : Weather very favorable for growth and work; all crops made rapid progress; haying well advanced and yield will be near average; clover very promising; all grains very good; potatoes promise good yield and other vegetables excellent; fruits are good, except apples, which are below average and dropping badly; tobacco satisfactory.

Week ending July 24. — New England. Boston : Weather very favorable for growth, harvesting, and marketing all crops, but rain now needed in nearly all sections; corn very good, tasselling in southern sections; small grains good; rye nearly harvested; oats and barley turning; haying nearly completed, with average yield of good quality; all vegetables good, and potatoes promise good crop; fruits good, except apples, which are much below average; tobacco good, and topping has begun.

THE WEATHER FOR JULY, 1905.

The cool weather which characterized the greater portion of June continued through the first four days of July, with showery, unsettled weather. On the 5th there was a decided rise in the temperature, and the hot weather continued without cessation until the 20th, inclusive. During the warm spell the mercury ranged in the 90s on nearly all days, and during the nights the temperatures were exceptionally high. The percentage of moisture in the air was excessive, particularly from the 6th to the 17th, inclusive, the humidity ranging from 15 to 20 per cent above the average. The high temperature, combined with the very moist atmosphere and light wind movement, made the weather conditions the most oppressive that have been experienced for some years. The warm weather was broken on the 21st, and comfortable temperature obtained, with slight exceptions, to the close of the month. There was a preponderance of fair weather during the month, although the percentage of sunshine was but little if any above the average. The rainfall was exceptionally light, except in a few instances of severe local storms, when heavy downpours of rain occurred. The droughty conditions did not unfavorably affect growing crops, for the ground was well supplied with moisture from the general and somewhat excessive rains of the preceding month, and the fair weather was very favorable to harvesting and housing the hay crop. The month as a whole was very near the normal as regards the temperature, the cool weather of the opening and closing days offsetting the warm period. But the rainfall of the month was one of the smallest of record for July.

In the circular to correspondents, returnable July 21, the following questions were asked : —

1. What insects are proving most troublesome in your locality?
2. What is the condition of Indian corn, and what proportion of the crop will be put into the silo?
3. What is the quantity and quality of the hay crop as compared with former years?

4. What forage crops are being raised to supplement the hay crop for the silo, and to eke out the pastures, and what is their condition?

5. What is the condition of market-garden crops, including potatoes, and how have those already harvested compared in yield and price with former years?

6. What is the prospect for apples, pears, peaches, plums, quinces, grapes and cranberries?

7. What is the condition of pasturage in your locality?

8. How have rye, oats and barley compared with former years, both as grain and forage crops?

Returns were received from 170 correspondents, and from them the following summary has been made :—

INSECTS.

Potato bugs appear to be more common than for several years past and to be doing very much more damage. An increasing number of correspondents report damage from gypsy and brown-tail moths. Aside from these insects there is surprisingly little damage reported. Other insects reported as doing damage are cut worms, squash bugs, rose bugs, currant worms, cattle flies and horn flies, cranberry vine worms, white grubs, wire worms, asparagus beetles, tent caterpillars, canker worms and grasshoppers.

INDIAN CORN.

At the beginning of the month Indian corn was very backward, but the warm weather of the month brought it forward very rapidly, until, at the time of making returns, it was little, if any, below the normal in development, and the prospect for the crop was very promising. With seasonable weather during the remainder of the summer a good crop of both grain and stover seems assured. A constantly increasing proportion of the crop is grown for ensilage every year, the greatest in the strictly dairy sections. Even here, however, there appear from the reports to be many towns where there are few silos, so slowly do progressive methods make their way.

THE HAY CROP.

The hay crop appears to be somewhat under the average in quantity on the whole, though probably less so than reports would indicate, as the tendency is to compare it with last year's heavy crop. The quality is generally reported to be excellent, and the crop was secured in good condition as a rule, though a few correspondents report injury from showers. Rain is needed to start the second crop.

FORAGE CROPS.

The acreage of forage crops is probably slightly increased, owing to the poor prospects for the hay crop early in the season. Corn is the most popular crop with the farmers, with the millets a close second, and oats, Hungarian grass and barley following, in the order named. Oats and peas are apparently gaining in popularity as a combination for soiling and the silo. Other forage crops grown are rye, wheat, cabbage, turnips and clover. Corn was generally in excellent condition at time of making returns, but the other crops were in some cases reported as showing the need of rain.

MARKET-GARDEN CROPS.

Market-garden crops are generally in good, though not extra, condition at the time of making returns, and prices received for those marketed had not varied much from the normal. Some complaints of poor germination and lack of moisture were received, but these were not from the principal market-garden sections.

EARLY POTATOES.

No early potatoes had been dug at the time of making returns, but the vines were generally reported to be in fine condition and promising well. Some correspondents report them to be setting poorly, but this is not at all a prevalent complaint as yet, whatever future results may show.

FRUITS.

The apple crop does not appear to be holding up to the promise of the early season. Reports indicate that the drop was unusually severe and not yet completed. Probably, however, more than an average crop for a non-bearing year will finally be secured. Pears will give only a light crop, and plums also appear to be below the normal. Peaches will be a good crop wherever the trees are still alive, though the total yield for the State will doubtless be much less than that at the last bearing year, prior to the late severe winters. Quinces appear to be about up to the usual average. Grapes set well, as did also cranberries, so far as reported on, though considerable injury to the latter crop is reported from vine worms in certain quarters.

PASTURAGE.

Feed in pastures is in unusually good condition for the time of year, according to the bulk of the returns, though some report it as failing and in need of rain, and a smaller number as dry and brown. Nevertheless, heavy rains are needed if the pastures are to continue to hold their own.

SMALL GRAINS.

Rye, oats and barley are reported to be good average crops, both for grain and forage, though little grown, especially the latter two, for anything save forage. Rye is a favorite early soiling crop, while oats are largely grown for hay and barley as a late soiling crop, owing to its ability to withstand frosts.

NOTES OF CORRESPONDENTS.

(Returned to us July 21.)

BERKSHIRE COUNTY.

Mount Washington (H. M. WEAVER). — Potato bugs are the only insect doing damage. Indian corn is backward, but is growing fast; two-thirds of the crop will go into the silo. Rye and oats are grown for hay, and corn is the principal forage crop for green feed. Potatoes promise to yield well, but none have been sold as yet. The prospect for fruits of all kinds is above the average. Pasturage is in better than average condition. Rye, oats and barley were better than average crops, both for grain and forage.

Tyringham (EDWARD H. SLATER). — Potato bugs are proving the most troublesome insects in this locality. The recent rains have improved the corn crop; about one-third of the crop will be put into the silo. There is about four-fifths of an average crop of hay of excellent quality. Corn and Japanese millet are raised to help out the pastures and supplement the hay crop. Potatoes are backward and none have been harvested as yet. Apples will be a light crop. Pastures are very dry. Oats and rye are looking well.

Becket (WM. H. SNOW). — Potato bugs are quite plenty. Moles are doing considerable damage to mowings. Indian corn is late; two-thirds of the crop will be put into the silo. Hay is from two-thirds to three-fourths of a full crop. Corn, millet and oats are the principal forage crops grown. Potatoes and market-garden crops are late. Pastures are in very good condition. Rye, oats and barley are average crops, both for grain and forage.

Washington (E. H. EAMES). — Potato bugs are doing some damage. Corn is the best crop for three or four years; one-third of the crop will go into the silo. The hay crop was light in quantity but of good quality. Corn is the principal forage crop grown. Apples will give a good yield; also pears and plums. Pasturage is in better condition than usual. Rye, oats and barley are about average crops, both for grain and forage.

West Stockbridge (J. S. MOORE). — Potato bugs and wire worms are doing some damage. Corn is looking finely, and grew rapidly during the hot weather; no silos in town. Fodder corn is grown to a small extent to help out the pasturage. Potatoes are looking well; early garden crops good. Apples will be a poor crop, owing to early frosts while the trees were in blossom. Pastures are in good condition. Rye, oats and barley are looking well. The hay crop as a whole is not as heavy as last year, but is of better quality.

Richmond (TIMOTHY B. SALMON). — Potato bugs are proving the most troublesome of any insect. Indian corn is about average in condition; only two silos in town. The hay crop is below the average in quantity and of average quality. Fodder corn and millet are the principal forage crops and are in very good condition. Market-garden crops are in very good condition; no potatoes harvested as yet. There will not be many apples; other fruits about average. Some pastures are in good condition and others are short, owing to the dry weather. Rye, oats and barley are average crops.

Peru (F. G. CREAMER). — Potato bugs are doing some damage. Corn looks well; very little grown for the silo. Hay is about an average crop in quantity and quality. Oats and fodder corn are the principal forage crops grown. No potatoes have been harvested as yet. Apples look well. Pastures are in good condition. Rye, oats and barley are about as usual, both for grain and forage.

New Ashford (ELIHU INGRAHAM). — Potato bugs are doing some damage. Indian corn is in good condition; none raised for ensilage. There was a fair crop of hay of good quality. Corn is the principal forage crop and is in good condition. Potatoes are looking finely, but none have been harvested as yet. The apple crop will be light; no other fruits raised. Pastures are in good condition. Rye, oats and barley compare well with former years, both as grain and forage crops.

Williamstown (S. A. HICKOX). — Potato bugs are doing some damage. Corn has come forward rapidly during the last ten days; one-fourth the crop will go into the silo. The hay crop is 90 per cent of a full crop in quantity, and of good quality. Corn, oats and peas are the principal forage crops grown. Potatoes are in good condition. Apples will be half a crop; pears a little less than half a crop; no peaches; plums 70 per cent. Pasturage is in very good condition. Rye, oats and barley promise well, both for grain and forage.

FRANKLIN COUNTY.

Monroe (D. H. SHERMAN). — Potato bugs are very plenty. There is little corn planted, mainly for ensilage, and it is late and backward. Quantity of hay crop less than average; quality good; weather bad for getting it. Japanese millet, barley, oats and corn are the principal forage crops grown. No potatoes have been dug as yet. There will be some apples; no pears or peaches; plums falling badly; cranberries blossomed full. Pasturage is in very fair condition. Rye, oats and barley are not raised for grain, and have not yet been harvested as forage crops.

Hawley (C. C. FULLER). — Potato bugs are doing some damage. Indian corn is in good condition, and about half the acreage will go into the silo. There is a fair crop of hay of good quality. Millet and corn are the principal forage crops grown. Market-garden crops are not grown in this locality. There will be a fair fruit crop. Pastures are in good condition. Rye, oats and barley are good crops, both for grain and forage.

Shelburne (GEO. E. TAYLOR). — There are some potato bugs. Corn is in first-class condition; possibly one-eighth of the crop is raised for ensilage. There was nearly an average crop of hay of No. 1 quality. Sweet corn and millet are the principal forage crops raised. Potatoes are in fine condition, but none have been dug as yet. There will be a very light yield of all fruits. Feed in pastures is fresh, but not so abundant as at some times. Rye, oats and barley are not raised, except oats for hay.

Gill (F. F. STOUGHTON). — Potato bugs are doing some damage. Indian corn is in good condition and is growing very rapidly; not a very large proportion of the crop will go into the silo. Some farmers had an average hay crop, and many a little less than an average one. Corn is the principal forage crop grown, with a little barley, oats and millet. Potatoes are rather uneven. There will not be a heavy yield of apples. Oats and barley are extra good crops.

Deerfield (H. A. WELLS). — Potato bugs are doing some damage. Corn is very promising, fully up to the average in condition; not over 10 per cent will go into the silo. Corn is the only crop raised for the silo; oats and peas are being fed green at present and made a heavy yield. No potatoes have been harvested, but a good crop is promised. There will be a fair yield of apples; pears and peaches light; plums and grapes good. Pastures have improved in condition since the recent rains. Rye, oats and barley are little grown. Corn and tobacco have developed very

rapidly during the past hot weather, both making a very healthy growth.

Sunderland (GEO. P. SMITH). — Insects are not especially numerous, but there are some potato bugs and cabbage maggots. Corn has made rapid growth, and is now up to the normal; 60 per cent of the crop will go into the silo. Quantity of the hay crop three-fourths of the normal; quality first class and secured in good condition. Little is raised for forage except corn. Market-garden crops good and prices satisfactory to date. Apples, pears and plums promise fair yields; peaches and grapes considerably winter-killed. Pasturage is normal for the time of year, though rather dry. Rye and oats are normal crops.

Northfield (T. R. CALLENDER). — There is the usual damage by the potato beetle. Corn is in fine condition and making unusual growth; about one-fifth of the crop is raised for the silo. The hay crop was below the normal, owing to the early drought. Corn, barley and oats are the principal forage crops grown. All garden crops are in excellent condition and have yielded well. Apples promise a fair crop for the off year. Pasturage is in fairly good condition. Rye, oats and barley are fully up to the average. Cucumbers for pickling promise a bumper yield; picking just begun.

Erving (CHAS. F. CLARK). — Potato bugs are doing some damage. Indian corn is looking well, and but a small proportion of the crop will go into the silo. There was a fair crop of hay of good quality. Forage crops of any kind are but little raised. Market-garden crops are in good condition. There will be a light crop of all kinds of fruit. Pasturage is in good condition. Rye, oats and barley are about average crops, both for grain and forage.

New Salem (DANIEL BALLARD). — Potato and squash bugs are very plenty. Corn looks promising; about half the crop goes into the silo. Quality of hay crop good, but yield rather light. Corn, Hungarian grass and peas and oats are the principal forage crops and are in fair condition. Potatoes are looking well, but none have been harvested. There will be light yields of apples, pears and peaches. Pastures are suffering from dry weather. Rye, oats and barley are full average crops, both for grain and forage.

HAMPSHIRE COUNTY.

Greenwich (WM. S. DOUGLAS). — Potato bugs are doing some damage. Indian corn is in good condition. There was not a full crop of hay, but it was of good quality. Corn is the principal

forage crop grown for use in the silo and green feeding. Potatoes are in good condition and promise an average crop. There will not be a very good apple crop. Pastures are in fair condition.

Enfield (D. O. CHICKERING). — Potato bugs are very plenty and are the only insect doing much damage. Indian corn is looking well; very little if any will be put into the silo. Quantity of the hay crop about two-thirds of an average crop, and quality good. Corn, millet and Hungarian grass are the principal forage crops grown. Potatoes are in good condition. There will be a fair fruit crop, but not up to the average. Pastures are very short on account of dry weather. Rye, oats and barley are about average crops, both for grain and forage.

Pelham (JOHN L. BREWER). — Potato bugs and horse and cattle flies are causing some trouble. Corn is much improved in condition the past two weeks; only a small part of the crop will be put into the silo. Hay is a much lighter crop than usual, with quality fair. Sweet corn and oats are the principal forage crops raised and they are looking well. Potatoes look well, but have not been harvested as yet. The prospect for fruit is not very encouraging. Pasturage is short. Rye, oats and barley are not raised extensively, but show fair yields.

Hadley (H. C. RUSSELL). — Insects are not troublesome, except the potato bug. Corn has improved very rapidly lately, but rain is needed for all crops. Hay will not be a full crop. Potatoes are looking fairly well. Corn is the principal forage crop raised, and mainly for the silo. There will be a light crop of apples; small fruits fairly good. Tobacco is looking well, but that late set is inclined to bud prematurely. Onions stand well and prospects are good for a full crop. Pastures are in good condition. Rye and oats look fairly well.

Northampton (H. C. COMINS). — Potato bugs are our most troublesome insect. Corn is in very good condition, having grown very rapidly since July 1; approximately one-third of the crop will go into the silo. Quantity of hay crop a little below average, but quality excellent. Corn is almost universally the forage crop grown. Garden crops of all kinds are suffering from drought; potatoes not harvested. There will be fair yields of apples, pears and peaches; short crops of plums and grapes. Pasturage is getting short, owing to drought. Rye and oats are fair crops; no barley raised. Tobacco looks very promising. Onions are commencing to rust. All crops need rain.

Westhampton (H. A. PARSONS). — Potato bugs are doing some damage. Corn is in good condition, and most of the crop goes into the silo. Hay is from three-fourths to seven-eighths of a

normal crop and of good quality. Potatoes are looking well. Apples half a crop; not many pears or peaches. Pasturage is in good condition for this time of year. Rye, oats and barley are little raised.

Cummington (S. W. CLARK). — Potato bugs are by far the most troublesome insect. Indian corn is rather backward, but is now growing fast. The hay crop was very heavy on moist, rich land, and light on sandy soil. Corn is the principal forage crop grown. Garden crops look well, but are not raised for sale here. Apples are our main fruit and are looking fairly well. Pasturage is in very good condition. Rye, oats and barley are normal crops. We have had frequent showers since haying commenced, and hay has been damaged thereby somewhat, but otherwise the quality is fine.

Goshen (ALVAN BARRUS). — Potato bugs are doing some damage. Corn is late, but looks well, and is largely raised for the silo. Quantity of the hay crop below the average, and quality good. Corn and oats are the principal forage crops grown. Potatoes are not yet harvested. The prospect is not encouraging for any kind of fruit. Pasturage is fairly good, but, as a rule, pastures are lightly stocked. Rye, oats and barley are about medium crops. Hay will be overripe before it is all secured.

Worthington (C. K. BREWSTER). — Potato bugs are more than usually prevalent. Corn is growing finely and promises well; but a small part of the crop will be put into the silo. Quantity of the hay crop a little short of the average, and quality good; weather catching. Corn, oats and Hungarian grass are the principal forage crops grown. Potatoes are not yet harvested, but promise well. Apples are dropping badly and other fruits will be light. Frequent showers have kept pastures in good condition. Rye, oats and barley are about average crops, both for grain and forage.

HAMPDEN COUNTY.

Tolland (EUGENE M. MOORE). — Potato bugs are the most troublesome insect in this locality. Indian corn is about two weeks late; only a small proportion of the crop will go into the silo. There is about two-thirds of an average crop of hay of good quality. Indian corn and millet are the principal forage crops grown. Apples and pears will be light yields. Pasturage is pretty well dried up, and feed is short. Rye is a good average crop; oats and barley not up to the average.

Granville (JOSEPH WELCH). — Potato bugs are the only insect doing damage. Corn looks very well; only a small portion of the

crop is used for the silo. Quality of the hay crop good, quantity from one-half to two-thirds of an average crop. Oats, barley, corn and Hungarian grass are the principal forage crops grown; but few raise forage crops to supplement the pastures. Apples are falling badly, and prospect for other fruits is uncertain. Pastures are very dry and feed is short. Rye, oats and barley look very well.

Russell (E. D. PARKS). — Potato bugs are doing some damage. Indian corn is looking well, but is rather backward; little of the crop goes into the silo. Hay is about a normal crop in quantity and quality, below if anything. Oats are the principal forage crop grown, and are in good condition. Potatoes are in very fair condition. Fruit of all kinds is looking well. Pastures are very poor on account of the early drought. Rye, oats and barley are not quite up to the normal.

Southwick (L. A. FOWLER). — Potato bugs are doing some damage. Indian corn is in fair condition, and about half the crop will be put into the silo. Owing to the dry weather, hay was about half a crop in quantity. Millet, Hungarian grass and oats are the principal forage crops raised. There will be about an average crop of fruit. Pastures are dry and brown from lack of rain. Rye, oats and barley compare favorably with former years, both for grain and forage.

West Springfield (T. A. ROGERS). — Potato bugs are very thick. Corn is looking finely now, and about half the crop will go into the silo. Quantity of hay crop under average, but quality all right. Corn, oats, peas and barley are the principal forage crops raised, with some cabbage for early market and trimmings fed to the cows. All market-garden crops have suffered more or less from drought; no potatoes dug as yet. Apples, pears, peaches and grapes are average crops; plums and quinces light. Pastures are nearly all bare and brown. Rye is very good; oats are cut for green feed and hay.

Chicopee (R. W. BEMIS). — There are few insects troubling us at this time. Indian corn is looking fairly well; silos are coming into more general use. Hay is about an average crop, both in quantity and quality. Oats and corn are the principal forage crops grown. Market-garden crops are about the same as in other years, as regards both yield and price. There will be about an average crop of all kinds of fruit. Pasturage has been fairly good so far this season. Rye, oats and barley are fair average crops, both for grain and forage.

East Longmeadow (JOHN L. DAVIS). — Potato bugs are very plenty. Corn is in first-class condition, but not one-twentieth of

the crop will go into the silo. There was a full crop of hay on new seeded land and a half crop elsewhere; quality excellent. Barley, millet, fodder corn and oats are the principal forage crops grown, and there has not been sufficient moisture for millet and barley. Potatoes are not setting well and need rain. Apples and pears will be half crops, and peaches a fair crop. Pasturage is all dried up. Rye and oats are full crops.

Wilbraham (H. M. BLISS). — Potato bugs are doing some damage. Indian corn is in good condition; one-fourth of the crop is used for ensilage. The hay crop is three-fourths of a full crop in quantity, and of good quality. Oats for hay, millet and Hungarian grass are the principal forage crops grown. Market-garden crops look fairly well; yield of those harvested three-fourths the normal, and prices lower. Apples will be a half crop; other fruits good. Pasturage is in very poor condition, owing to dry weather. Rye and oats are nearly full crops. Cows are shrinking very badly in their milk. Peaches promise a good crop.

Palmer (O. P. ALLEN). — Potato bugs are the insect most in evidence. Corn is backward, but is improving fast with the recent rains; the usual amount will go into the silo. The hay crop is much less than usual in quantity, but is of good quality. Corn and rye are the principal forage crops grown. Market-garden crops are in fair condition; yield of early crops normal, and prices the same as usual. Fruit is promising, with the exception of peaches. Pasturage is not quite up to the average in condition. Rye, oats and barley compare favorably with other years, both as grain and forage crops.

WORCESTER COUNTY.

Warren (W. E. PATRICK). — Potato bugs are more troublesome than usual. Indian corn is looking finely; only a small proportion of the crop will go into the silo. There was a good average crop of hay of excellent quality. Hungarian grass, millet, corn, oats and peas and barley are the forage crops grown. Market-garden crops yielded well, prices fair; potatoes are looking finely. The prospect is poor for fruit of all kinds. Pasturage is in poor condition. Oats are a large crop; rye medium.

New Braintree (C. D. SAGE). — Potato bugs are doing some damage. Corn is looking well, but is still backward; perhaps 25 per cent of the crop will be put into the silo. There was about an average crop of hay of good quality. Forage crops are little grown, except fodder corn, which is looking well; grain is usually fed where pastures are short. Market-garden crops are little

grown ; potatoes looking well. There will be very few apples and pears, a few peaches and plums and a fair crop of grapes. Pasturage is in fair condition, but needs more rain. Very little rye or barley is grown ; oats are looking well, and are nearly all cut for hay.

Dana (LYMAN RANDALL). — Potato bugs and cut worms have done more damage than usual. Corn is coming forward rapidly, and promises to be a good crop ; probably about one-fourth will go into the silo. There will not be over three-fourths of an average crop of hay in quantity, but the quality is better than usual. Corn, oats and millet are the principal forage crops, and they are looking well. Market-garden crops are doing well, and those harvested have yielded well and brought average prices. Fruit has dropped badly, but is still fairly good ; grapes promise a heavy crop. Pastures are in fair condition, but need rain. Rye is not as good as usual, while oats are better.

Phillipston (A. D. CLIFFORD). — Potato bugs are the only insect doing much damage here. Indian corn is in fair condition, and at least half the crop will be put into the silo. Hay is nearly an average crop. Oats and peas, barley, Hungarian grass and millet are the forage crops mostly grown, and are looking well. Market-garden crops are doing well, but prices have been low ; no potatoes dug as yet. Apples are a light crop ; not many other fruits raised. Pasturage is fair since the rains. Oats and barley are good average crops, but mostly used for forage ; not much rye raised.

Templeton (LUCIAN GOVE). — Potato bugs are the most common insect, but the brown-tail moth is doing some damage. Corn is a little backward, but is growing rapidly ; three-fourths of the crop will be used for ensilage. The hay crop is smaller than for the past three years, but of good quality. Oats, barley, Hungarian grass and millet are the principal forage crops grown, and are generally in good condition. Market-garden crops rather late, but doing well ; yield of those harvested light, and no material change in prices. Apples and pears will be light ; plums below average ; peaches, grapes and cranberries not raised to any extent. Pastures are quite good for the season, the recent rains having helped them much. Winter rye is poor ; oats and barley quite good.

Westminster (A. J. FOSKETT). — No insects are doing damage. Corn is in first-class condition ; there are but few silos in town. The hay crop is fully up to the normal in quantity and quality. Oats, barley and millet are the principal forage crops grown, and all are doing well. Market-garden crops are making a favorable

showing in both yield and price. There will be light crops of all fruits. Pasturage is in A1 condition for the time of year. Rye, oats and barley are not raised for grain.

Fitchburg (DR. JABEZ FISHER). — Some potato bugs are in evidence. Indian corn is growing rapidly, conditions for this crop being now perfect. Hay is almost a normal crop in quantity and quality. There will be a small crop of apples; pears fair; peaches, plums and grapes good. Pasturage is in very good condition.

Harvard (JOHN S. PRESTON). — No insects are proving troublesome. Indian corn is looking very well, but is not as forward as usual though growing fast. Hay is not an average crop in quantity, but is of good quality. Oats, fodder corn, Hungarian grass and millet are the principal forage crops grown, and all are doing very well. Condition of market-garden crops good except potatoes, which are not as good as usual. Apples will be about half a crop; pears light; peaches good; plums, quinces, grapes and cranberries but little raised. Pasturage is in very good condition. Rye, oats and barley are not raised for grain, but as forage crops are in average condition.

Bolton (H. F. HAYNES). — Potato bugs are doing some damage. Indian corn is growing rapidly. The hay crop was about three-fourths of the normal in quantity and of good quality. Millet is the principal forage crop grown. Potatoes as a whole are in rather poor condition. The prospect is poor for all kinds of fruit. Pasturage is in very good condition, but begins to feel the dry weather. Rye, oats and barley are raised only for hay, and are all in good condition.

Sterling (HENRY S. SAWYER). — Potato bugs are doing some damage. Corn is looking well and growing rapidly; one-fourth the crop will be put into the silo. There is an average crop of very good quality. Oats, barley, millet and corn are the principal forage crops grown. Market-garden crops are rather late on account of the dry spring; asparagus was scarce and high. All fruits are looking well and promise good crops. Pastures are in fairly good condition. Rye, oats and barley are about average in condition.

Worcester (SILAS A. BURGESS). — Potato bugs are doing some damage. Indian corn is in average condition, and 75 per cent of the crop will go into the silo. The quantity of the hay crop is a little less than normal, but its quality is better than average. Corn, millet, Hungarian grass are the principal forage crops, and they are in good condition. Market-garden crops have been about average in both yield and price. Apples will be a good crop; pears

fair; other fruits average. Pasturage is in good condition. Rye and barley are average crops, but oats are light. Crops as a whole look well, and the prospect is good.

Oxford (D. M. HOWE). — Potato bugs are doing some damage. Corn is doing well, and three-fourths of the crop will go into the silo. The hay crop was light this year. Millet, barley and Hungarian grass are the principal forage crops grown, and are in fine condition. Apples and pears few; few peaches raised here. Pastures are in fairly good condition. Oats promise well, so far as I have seen.

Milford (JOHN J. O'SULLIVAN). — Potato bugs are doing some damage. Indian corn is a good crop, and one-fifth of it will go into the silo. Hay was a good crop as regards quantity, but of rather poor quality. There is little raised for forage crops except fodder corn and millet. Market-garden crops are in good condition, but prices have been a little lower than usual. The prospect is good for all kinds of fruits. Pasturage is in fair condition. Rye, oats and barley are little raised.

MIDDLESEX COUNTY.

Sherborn (N. B. DOUGLAS). — Cut worms are doing more damage than I have ever noted on certain farms. Indian corn never looked better or grew faster; half the crop is used for ensilage. The hay crop is about average both in quantity and quality. Hungarian grass, Japanese millet, wheat, rye, oats and barley are the forage crops grown, and all promise well. Market-garden crops are little harvested as yet. Apples will give a light crop; peaches, grapes and cranberries full crops. Pastures are in fairly good condition. Rye, oats and barley are all raised for forage and made good yields.

Sudbury (EDGAR W. GOODNOW). — Potato bugs are the most troublesome insect in this locality. Indian corn is looking well, and the greater part of the crop will go into the silo. Oats and corn are used to supplement the hay crop and are looking well. Market-garden crops of all kinds are looking well; prices normal. Apples, pears, quinces and grapes are looking favorably, but the peach crop was a failure. Pasturage is looking unusually well in this locality.

Stow (GEO. W. BRADLEY). — Potato bugs are doing some damage. Corn is backward, but is growing fast at present; perhaps half the crop will go into the silo. The hay crop is about two-thirds of an average crop in quantity, but of very good quality. Hungarian grass and fodder corn are the principal forage crops

grown, and are looking well. Potatoes are looking well; none harvested as yet. There are quite a few apples in some orchards; other fruits not very plenty. Pasturage is very fair for the time of year. Rye, oats and barley were about average crops, but mainly cut for fodder.

Groton (C. H. BERRY). — Potato bugs are doing some damage. Indian corn is looking finely; about half the crop is raised for the silo. There was about a two-thirds hay crop of very fine quality. Oats and millet are the principal forage crops grown, and are early for harvest. Market-garden crops are looking finely. Peaches promise a good crop. Pastures are in very fair condition. Rye, oats and barley promise very favorably, both for grain and forage.

Dunstable (A. J. GILSON). — Potato bugs are doing some damage. Indian corn is in good condition, but about two weeks late; the usual amount will go into the silo. The hay crop is about normal in both quantity and quality. Oats, barley, Hungarian grass and corn are raised as forage crops and are in good condition. No potatoes have been harvested as yet. Grapes and cranberries promise fair crops; all other fruits very light. Pastures are very short of feed. Rye, oats and barley compare well with former years, both for grain and as forage crops.

Tewksbury (G. E. CROSBY). — Potato bugs are still at work on potatoes and tomatoes. What Indian corn there is raised here is looking well, but there will be but little put into the silo. The hay crop was good on newly seeded land, and from 50 to 60 per cent of a full crop on old land. Japanese millet is raised to some extent as a forage crop. Market-garden crops are not as good as usual. There will be few apples; plums and pears promise good crops. Pastures are very dry. Rye, oats and barley compare very well with former years, both as forage and grain crops.

Lincoln (C. S. WHEELER). — Potato bugs are doing some damage. Indian corn is in average condition; three-fourths of the crop will go into the silo. The hay crop was average in quantity, though less than last season. Oats, Hungarian grass, Japanese millet, barley and rye are the principal forage crops grown. Market-garden crops are about average in condition; strawberries have been a light crop, but brought good prices; greenhouse cucumbers sold well. There will be about half crops of fruit of all kinds. Pasturage is in about the usual condition, or perhaps a little above the average. Rye, oats and barley have not been raised for grain, but are average crops for forage.

Wakefield (CHARLES TALBOT). — Brown-tail and gypsy moths are doing much damage. Corn is looking very well, fully up to the average, and the usual amount will go into the silo. Hay is

about 80 per cent of last year's yield in quantity, but of much better quality. Corn is the principal forage crop grown. Potatoes are very plenty and very good; yield and prices of market-garden crops good. Some orchards of apples are looking well; pears not up to the standard; no peaches; plums plenty; other fruits average. Pastures are in very good condition. Rye, oats and barley are looking well.

Winchester (S. S. SYMMES). — Gypsy moths are the most troublesome of any insect. Indian corn is not raised here. The hay crop is 80 per cent of the normal, both in quantity and quality; gypsy moth caterpillars have eaten several acres of hay. Fodder corn is the principal forage crops grown, and is beginning to suffer from drought. Prices have been low for market-garden crops except for cucumbers. Gypsy moths have defoliated all the apple trees; peaches fair; plums scarce. Pastures are badly dried up. Rye is in good condition; no barley or oats grown.

Arlington (W. W. RAWSON). — Gypsy and brown-tail moths are doing the most damage of any insects. The hay crop was a good one, both in quantity and quality. Market-garden crops are all looking finely, and celery is starting well. There will be a light fruit crop.

Newton (G. L. MARCY). — No insects are more than usually troublesome. Corn is not much grown except for the silo. Hay was a two-thirds crop of good quality. Oats, barley, millet and corn are the principal forage crops, and are in good condition, except that they are somewhat lodged by wind and rain. Market-garden crops are doing well; no potatoes dug as yet. Pears and plums promise well. Pasturage is in good condition since the late rains. Rye, oats and barley are about average crops.

ESSEX COUNTY.

Amesbury (F. W. SARGENT). — Potato beetles are the only insect doing appreciable damage. Corn is in nearly average condition; half the crop is grown for ensilage. The hay crop is of extra quality and a full crop, though possibly 10 per cent below that of 1904. Corn, oats and barley are the principal forage crops, with an occasional piece of millet. It is rather dry for potatoes, but generally vegetables are growing well. All fruits, with the exception of Baldwin apples, are likely to be plenty. Pastures are in fair condition, but more rain is needed.

Haverhill (EBEN WEBSTER). — Rose bugs are doing some damage. Corn is looking fairly well on moist land, but is suffering from drought on dry land. Oats and peas, Hungarian grass, corn and

millet are the principal forage crops grown and are in fair condition. Apples will be a two-thirds crop; pears light; peaches good; plums half a crop; grapes good. Pasturage is in good condition. Rye, oats and barley are fair crops, but are grown only for forage. It has been quite dry here for three weeks.

Andover (MILO H. GOULD). — Potato bugs, striped squash bugs and rose bugs are doing some damage. Indian corn is backward, and all goes into the silo about here. Hay is an average crop of good quality. Japanese and golden millet are the principal forage crops grown. Market-garden crops are backward, and those already harvested have made less than average yields, with prices low. Apples promise a fair crop for the odd year; pears fair; peaches and plums good; grapes good; cranberries small. Pasturage is in fairly good condition. Rye, oats and barley are not raised.

Newbury (GEO. W. ADAMS). — Brown-tail moths and potato bugs have been our most troublesome insects. Corn is in good condition; half the crop will go into the silo. There was about a two-thirds crop of hay of good quality. Corn and oats are raised for forage in a small way, and are in from fair to good condition. Market-garden crops are in good condition, with yields fair and prices about as usual. There will be small crops of apples and pears; peaches average; plums good; grapes light. Pasturage is in very fair condition. Rye, oats and barley are good average crops.

Rowley (D. H. O'BRIEN). — Potato bugs and squash bugs are proving troublesome. Indian corn is in good condition, but very little of it will be put into the silo. The hay crop is a little less than usual in quantity, but of good quality. Corn is almost the only crop raised to eke out the pastures and is looking well. Market-garden crops compare well with former years in yield and price; potatoes not dug as yet. There will be very few peaches; the apple crop is very uneven; other fruits look well. Pasturage is rather poor. Rye, oats and barley are only raised for forage, and rye and barley but little for that purpose.

Manchester (JOHN BAKER). — Gypsy and brown-tail moths are doing much damage. Indian corn is in good condition; no silos in town. Quantity of the hay crop rather below the average, but quality good. Corn and rye are the principal forage crops grown and are in good condition. Market-garden crops are in good condition, and those already harvested have been about average in yield and price.

NORFOLK COUNTY.

Westwood (HENRY E. WEATHERBEE). — Potato bugs are more plenty than usual, and cut worms have done considerable damage. Corn is looking well since the hot weather. Hay was a full crop and of fine quality on land that is in good condition, but a light crop on old land. Fodder corn and Hungarian grass are raised to eke out the pastures, and are in good condition. Potatoes are a fairly good crop, but there is some complaint of their not setting well. Apples, pears, peaches, plums and grapes are looking well now. Since the late rains pastures are looking well. Rye, oats and barley have been good crops, both for forage and grain.

Norwood (FRANK A. FALES). — Squash bugs and potato bugs are our most troublesome insects. Indian corn is late; but a small percentage of the crop is used for ensilage. Hay is about a three-fourths crop of fair quality. Japanese millet and Hungarian grass are raised to help out the pastures. Market-garden crops are in good condition and prices have been good; no potatoes dug as yet. All fruits are looking well at this time. The hot spell dried up the pastures. Rye, oats and barley have done well, and oats unusually so.

Randolph (RUFUS A. THAYER). — Potato bugs are doing some damage. Indian corn is in excellent condition, and nearly all the crop is used for the silo. There is a good average crop of hay of good quality. Oats, Hungarian grass and the millets are the principal forage crops grown, and are in good condition. Market-garden crops are up to the average in yield, but prices are rather low. Apples and pears promise good crops; peaches and grapes badly winter-killed.

Walpole (EDWARD L. SHEPARD). — Potato bugs, squash bugs and rose bugs are doing some damage. Corn is looking well, but is rather late; half the crop is raised for the silo. The hay crop is 80 per cent of a full crop in quantity, and of fair quality. Fodder corn, oats, Hungarian grass and millet are the principal forage crops grown, and are in good condition. Potatoes are looking well. Market-garden crops came up poorly, but are looking well where they came up well; prices about as usual. Apples will be half a crop; other fruits fair. Pasturage is in normal condition. Rye, oats and barley are above average crops, both for grain and forage.

Millis (E. F. RICHARDSON). — Potato bugs and rose bugs are doing some damage. Corn is looking finely; three-fourths of the acreage goes into the silo. There is about an average crop of hay

of good quality. Oats and peas, fodder corn, Japanese millet, Hungarian grass and the clovers are the principal forage crops grown. Market-garden crops are in good condition; potatoes looking well; prices about average. Pastures are in fair condition. Rye, oats and barley are better than average crops.

Franklin (C. M. ALLEN). — Potato bugs are doing some damage. Indian corn is in fine condition; one-half the crop will go into the silo. There was a three-fourths crop of hay of fine quality. Millet, barley and fodder corn are the principal forage crops grown, and are in fine condition. Market-garden crops are in average condition as regards both yield and price. Apples will be a poor crop; pears and plums light; peaches good. Pasturage is in average condition.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Potato bugs and currant worms are our most prevalent insects, but neither are very troublesome. Corn came up rather unevenly, but looks fairly well; very little put in silo in this locality. Hay is perhaps 80 per cent of the normal in quantity, and of good quality. Sweet corn and Hungarian grass are the principal forage crops. Apples medium; pears fair; peaches poor; plums, quinces and grapes looking well, but the latter late. Except peas, which have been scarce and higher than usual, there are few market-garden crops in the market; potatoes lower. Owing to dry weather, pastures are generally poor. Rye, oats and barley are normal crops.

Attleborough (ISAAC ALGER). — Potato bugs are doing some damage. Indian corn is in good condition, and half the crop is raised for ensilage. Hay is a full average crop in both quantity and quality. Millet, corn and Hungarian grass are the principal forage crops grown. Potatoes look well, but none have been dug as yet. The prospect is poor for all kinds of fruit. Rye, oats and barley are about average crops, both for grain and forage. A great many grape vines, quince bushes and cranberry vines winter-killed.

Norton (WM. A. LANE). — Potato bugs are doing some damage. Corn is in good condition, and but a small part of the crop goes into the silo. The hay crop is about average in yield and quality. Oats and millet are the principal forage crops grown. There is no great amount of market-garden crops raised in this locality. There will be a very light fruit crop; some apples and plums. Pastures are in good condition. Oats have been a good crop and rye a fair one.

Seekonk (FRED A. HOWE). — Potato bugs and striped squash bugs are doing some damage. Corn is looking finely, and only a very small portion of the crop goes into the silo. Hay was not an average crop in quantity. Oats, barley and spring rye are the principal forage crops grown, and are in first-class condition. Market-garden crops have been good, but prices have been low. There will be a good crop of apples. Pasturage is in poor condition. Rye, oats and barley are about average crops, both for grain and forage.

Westport (ALBERT S. SHERMAN). — Potato bugs, squash bugs and rose bugs are doing some damage. Corn looks well; none raised for the silo in this vicinity. The hay crop is rather a light one, but of good quality. Corn and oats are largely raised as forage crops. Market-garden crops are not yielding well, yet prices are lower than in former years. Apples, pears and peaches promise well; plums, quinces and grapes will be scarce. Pasturage is in fair condition, rather better than is usual in July. Rye and oats were never in better condition.

Dartmouth (L. T. DAVIS). — Potato bugs are doing some damage. Indian corn is in very good condition, and three-fourths of the crop are raised for the silo and for fodder. The hay crop was rather below the average in quantity, but of fine quality. Millet and barley are the principal forage crops grown. Market-garden crops have given normal yields, but prices have been below the average. Apples, 75; pears, 80; peaches, 40; plums, 10; grapes, 60. There is still moisture enough to keep pastures in good condition. Rye, oats and barley are good crops, both for forage and grain.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Cut worms are doing some damage. Corn is late, but is growing fast now; half the crop will be put into the silo. Hay is fully up to an average crop on good land. Corn, Hungarian grass and millet are the principal forage crops raised. Market-garden crops are rather below the average, both in price and yield. There is not a very good outlook for apples, and there will be no peaches. Pastures are generally pretty dry, but the late showers should help them. Rye was a very good crop; oats and barley not raised for grain.

Hanover (HARRISON L. HOUSE). — Cut worms and currant worms are doing some damage. Indian corn promises a fair crop; no silos in this vicinity. The hay crop was not over two-thirds of the normal in quantity, but was of good quality. Oats and cow-peas are the principal forage crops grown, and are in good con-

dition. Market-garden crops promise fairly well, but potatoes are not in very promising condition; prices about as usual. There will be a fair yield of apples, a good one of pears and cranberries, a poor one of grapes, no peaches or quinces and few plums. Pastures are fairly good. Rye and oats are little raised, but are good crops.

Pembroke (NATHANIEL MORTON). — Cut worms are doing some damage. Indian corn is grown to a very limited extent in this locality, and none is grown for the silo. Quality of hay crop good, but quantity rather less than half. Hungarian grass is the principal forage crop grown. Market-garden crops in poor condition; yield and prices average for those harvested. Apples, pears, peaches, grapes, plums, quinces and cranberries will all give light crops. Pasturage is poor and limited. Rye, oats and barley are not up to the average.

Duxbury (ROBERT T. RANDALL). — Cut worms and potato bugs are our most troublesome insects. Indian corn is looking well, but only a small proportion of the crop is grown for the silo. There is about a two-thirds crop of hay. Hungarian grass, millet, oats and barley are the principal forage crops grown. Market-garden crops are suffering badly from drought; prices about as usual. There will be fair crops of apples and cranberries; other fruits about the same as formerly. Pasturage is short. Rye, oats and barley are about average crops, both for grain and forage.

Kingston (GEO. L. CHURCHILL). — Potato bugs are doing some damage. Corn looks to be a good crop; not much raised for the silo. Hay was about a two-thirds crop of excellent quality. Corn and millet are the principal forage crops raised. Not many market-garden crops have been harvested, but they look well. There will not be large yields of fruit in this section. Pasturage is very good. Rye, oats and barley look well.

Lakeville (NATHANIEL G. STAPLES). — Potato bugs are doing some damage. Indian corn is in good condition; none of the crop will go into the silo. Hay is 10 per cent less than an average crop in quantity, but of good quality. Corn is the principal forage crop grown. Market-garden crops are not up to the average in condition; potatoes below the average in quantity and price. Apples fair; peaches good; all other fruits about as usual. Pastures are in good condition. Rye, oats and barley are a little better than average crops.

Rochester (GEO. H. RANDALL). — Potato bugs, cut worms and web worms are doing some damage. Indian corn is in good condition; but little is grown for the silo. Hay is fully an average

crop in quantity, and of good quality, and was generally got in good condition. Corn, millet and barley are the principal forage crops grown. Market-garden crops are in good condition, and those marketed have brought fair prices. Apples half a crop; pears average; peaches few; plums plenty; few quinces; grapes and cranberries set well. Pastures are getting short, on account of dry weather. Rye, oats and barley are better than average crops. Onion maggots have been very destructive.

BARNSTABLE COUNTY.

Bourne (DAVID D. NYE). — Potato bugs are doing some damage. Corn looks well, but none is used for ensilage. The hay crop is of better quality than last year and average in quantity. Corn fodder, oats and peas are the principal forage crops grown. Garden crops look well; potatoes also; yield and prices above average. There is prospect of a small crop of apples; pears and cranberries fair; no peaches, plums or quinces. Pasturage is looking well. Rye, oats and barley made good yields as forage crops. The late rains have put new life into all vegetation.

Falmouth (D. R. WICKS). — Potato bugs are doing some damage. Corn is looking finely and making rapid growth; there are but two or three silos here. The hay crop was about normal as a whole, but not of good quality. Corn and millet are the principal forage crops grown. Market-garden crops compare well with the normal in yield and price. Apples, peaches, plums and quinces will be failures; grapes fair. There is plenty of feed in pastures, with wet and hot weather to make it grow. Rye, oats and barley, where grown, are fully up to the normal.

West Barnstable (JOHN BURSLEY). — Fire worms are doing some damage to cranberries, potato bugs to potatoes, and the green-headed fly is troubling cattle. Indian corn is in good condition; none goes into the silo. The hay crop was good both in quantity and quality. There are no forage crops raised except oats, which are grown for hay. Potatoes look well; few harvested as yet. Pasturage is in fair condition. Rye was a light crop; oats very heavy.

Brewster (THOS. D. SEARS). — Cranberry worms and potato bugs are doing some damage. Corn is looking finely; about one-third of the crop is raised for the silo. The hay crop is heavier and of better quality than last year. Corn is the principal forage crop and is looking well. Market-garden crops look fairly well, and prices are about as last year. There will be a small yield of

all kinds of fruit. Pasturage is drying up on account of the drought. Rye, oats and barley compare favorably with other years, both as regards grain and forage.

Harwich (AMBROSE N. DOANE). — Cranberry vine worms have been the most destructive insect with us. There are no silos in town; Indian corn is looking fairly well. The hay crop was very good, both in quantity and quality. Corn is our principal forage crop. Potatoes were never better, and market-garden crops have done well in yield and price. Apples are a poor crop and falling badly. Pasturage is in very good condition. Rye, oats and barley are good crops. Cranberries are our principal crop, and are not doing well, owing to injuries by worms.

Eastham (J. A. CLARK). — Insects are not troublesome this season. The hay crop was fair in quantity, and of good quality. Fodder corn is the principal forage crop grown, and is in good condition. Market-garden crops and potatoes are badly in need of rain. There will be a light crop of all kinds of fruit. Pastures are getting very dry. Rain is badly needed by all crops as the ground is very dry.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Potato bugs and cattle flies are causing some trouble. Indian corn is in fair condition, and only a small part of the crop will be put into the silo. The hay crop was above the average in both quantity and quality. Corn and millet are the principal forage crops grown, and are both in good condition. Market-garden crops are in average condition. There is a fair prospect for fruits of various kinds. Pastures are in very good condition. Oats are a large crop, but were mostly cut for hay.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — Potato bugs are doing some damage. Corn is looking finely; no silos here. The hay crop was extra good in quantity and quality. Fodder corn is the principal forage crop grown, and is in good condition. Garden crops are good in both yield and price. Cranberries are looking fairly well. Pasturage is in good condition. There is an average crop of oats. Potatoes are nearly a failure from blight, and many fields will not be harvested.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

BUSH-FRUITS.

By Prof. FRED S. CARD, *Professor of Horticulture, Rhode Island College of Agriculture and Mechanic Arts.*

The bush-fruits represent a type likely to be neglected, though one well worthy of consideration in most localities. They ought, by all means, to appear in every home garden, and in many places would prove desirable market fruits. Many New England markets are poorly supplied with these fruits, and where conditions are favorable to their growth, they might prove a source of profit to numberless local growers.

Judging from our experience at the Rhode Island Experiment Station, some of them do not thrive well near the shore, being especially subject to winter-killing.

Two general classes of fruits are included under the term bush-fruits, differing in their botanical relationships and habits. The brambles, which include the raspberries and blackberries, are the ones most likely to suffer from unfavorable climatic conditions here in New England. The groselles, which include the currant and gooseberry, are seldom injured by cold, and generally succeed, though the English gooseberry cannot be depended upon to thrive. Owing to their different characteristics, it seems better to treat these two groups separately.

THE BRAMBLES.

Soil and Climatic Conditions.

The brambles are not particular in their soil demands. It is chiefly necessary that the soil shall not be wet, nor too dry. On heavy wet soils they will not thrive and are very subject to winter-killing. On a light dry soil they suffer from summer drought and the fruit does not reach its full size and flavor. With suitable moisture conditions the particular type of soil is of only moderate importance.

Medium fertility is best suited to their needs. This is particularly true of the red raspberries and blackberries. While blackcaps will prosper on a rich soil, the red raspberries and blackberries are likely to make a rank growth, suffer from winterkilling and yield a small amount of fruit.

The climate best suited to their growth seems to be one neither too humid nor too dry. A humid climate appears to induce more winter-killing. The same result may be brought about by an unusually dry climate, such as we find on the plains of the west, to which is added the injury from summer drought. Winter-killing is not governed entirely by temperature. Our winter temperatures in Rhode Island seldom get

much below zero, and are never so severe as in the interior of New England, yet these fruits will pass the winter with much less injury in the colder interior than with us. Laying down and covering the plants during winter will sometimes afford a sufficient protection, particularly in cold climates. With us it has not proved uniformly successful. Either the protection has been insufficient or the injury was done before the plants were put down. In many northern localities, however, this practice is regularly followed and must give good results.

One rather strange fact with regard to winter-killing is that the smaller, late-growing canes seem to pass the winter better than the larger and apparently more mature ones, which have grown during the entire season. This suggests a possible means of reducing winter injury by pulling out all the first young canes when well started and allowing the later ones to take their place. Why these small canes are more hardy than those of earlier growth I am unable to say, but I have observed this to be the fact in several instances.

The site, or particular elevation of land chosen, is sometimes of great importance. Not only frosts are more frequent on low lands, but the cold of winter is also more intense. Plants may therefore escape injury on high lands which would be severely hurt in the valley near by. We find these conditions often marked on our college farm, though the difference in elevation is but little. A series of temperature records taken last winter often show differences of six and eight degrees in the minimum temperature between different points chosen on the farm. At times the extremes were even greater than this.

Fertilizers.

How to fertilize bush-fruits is to some extent a still unsolved problem. Some tests made in our experiment station work gave very conflicting and unsatisfactory results. If stable manure is available, it can always be safely used to a limited extent. Blackcaps will make use of a liberal supply to good advantage, but it must not be used in too large amounts for red raspberries and blackberries, particularly if the soil is already fairly fertile. This may be supplemented with potash in any convenient form, since, like all other fruits, the bush-fruits are benefited both in yield and quality by this element. If chemicals alone must be depended upon, it is largely a question of personal trials to learn what will give best results under the given conditions. Judging from theoretical reasons, as well as from some hints derived from our trials here, I am inclined to believe that nitrogen in the form of blood or tankage may give better results than nitrogen in the form of soda. This is only a suggestion, and may not prove true under general conditions.

Preparation and Planting.

Ordinarily deep and thorough preparation of the soil is all that these fruits demand unless upon land which requires underdraining. With a heavy soil, retentive of moisture, underdraining should prove as profitable with these crops as with others. Sod land should be avoided because of the greater difficulty and uncertainty in planting; old sod may also be infested with white grubs, which may cause considerable loss of plants.

The distance apart for plants may vary with the kind of fruit and the preference of the planter. Raspberries will do well with rows six feet apart and the plants three or four feet apart in the row. Some successful growers prefer to make the rows of blackcaps seven feet apart. Blackberries need more room. Seven or eight feet apart is none too far for the vigorous growing varieties.

The methods of planting are simple. In a large way, it can be most

conveniently done by plowing a furrow where the row is to be and setting the plants with the hands in this furrow. Only enough earth to fully protect the plants need be thrown into the furrow, leaving the remainder to be filled in by subsequent cultivation.

The selection of varieties is largely a personal and local matter. Each grower should take the fruit of his choice if it will thrive in his locality. Some varieties are generally successful, while others thrive only in limited areas. Varieties of blackcaps have changed more than those of the other classes, and those sorts which were most prominent fifteen years ago are little grown now, except, perhaps, in the evaporating industry. Kansas and Nemaha are two which have done well in our trials, one being early, the other late. With red raspberries, Cuthbert is still the leader. This is a late berry, too dark in color, but as yet I have looked in vain for an earlier and brighter berry which is equally good. In some parts of New England I am told that the Phoenix is giving good satisfaction as an earlier berry, but there is no well tested kind that can rank with Cuthbert. In blackberries, Snyder is the hardiest sort, but not of good quality. Taylor is a much better berry and nearly as hardy. Early Cluster is a fine early variety which has given good satisfaction with us but which is not uniformly popular.

Some varieties of brambles are greatly helped by being planted in proximity to other kinds, so that interpollination may take place. This may be more important than we think, even with varieties which do not absolutely need it. It is a simple thing to do in any case and is a point always worth considering. All these fruits often show small and imperfect berries, due to the fact that too few of the pistils of a given bloom have been fecundated.

Methods of Propagation.

Propagation of the brambles is simple. The suckers which are freely thrown up by raspberries and blackberries are most frequently used for planting. Plants may also be produced by root cuttings when necessary. It is sometimes claimed that root-cuttings make better plants, but I have never been able to verify such claims.

While generally planted in spring as one-year-old canes, they may also be moved in summer when growing, in the same manner that tomato plants would be handled. The blackcaps require some attention if many plants are to be obtained from them. The canes take root readily from the end when growing in their natural habitat, among weeds and grass, but in a cultivated field they are often kept in such constant motion by the wind that they do not have an opportunity to root. When the canes begin to thicken and assume a snake-like appearance they should be buried deep enough to hold them in place, when they will readily root. Pinching the growing canes early, while still low, thus inducing the formation of low branches, will make it possible to obtain more plants than otherwise.

After-culture.

The same tillage which would be given a cornfield is suitable for a bush-fruit plantation. A cultivator which runs shallow and leaves a fine earth mulch should be chosen. It is important that this mulch should be kept in perfect condition, since so much of the success of the crop depends on an adequate moisture supply during the heat of summer, when the fruit ripens. For the early spring cultivation in subsequent years, a heavier cultivator may be needed. In some cases a plow is used, but this should be avoided when possible, and if needed should be run very shallow.

The introduction of a cover-crop, as is now so frequently done in orchards, possesses some advantages among bush-fruits, the chief diffi-

culty being in destroying the crop the following spring. In our experiments here a plat which was sown with a cover-crop in August gave decidedly better results than an adjoining portion without a cover-crop. In most of New England mammoth clover will prove a more reliable plant for this purpose than crimson clover. The advantage of clover is that it adds nitrogen as well as humus, and with a good growth little or no nitrogen will be needed in the fertilizer. The past spring mammoth clover on our grounds showed a uniformly strong, bright green cover, while crimson clover was nearly all dead. Some winters the latter will go through with little harm.

Whether to keep blackberries and red raspberries in hills or allow them to form hedge-rows must be decided soon after tillage begins. Under favorable conditions, hills give good results, but with us hedge-rows have yielded much better. The cultivator should be kept close to the rows to prevent the hedge from becoming too wide. In older plantations some thinning out may be desirable, but this is expensive and should be avoided. It is usually better to replant in a new location rather than spend much time in thinning an old hedge.

Pruning.

Pruning methods differ. Some prefer to let plants of all varieties grow their own way during the summer, merely thinning out and cutting back the canes the following spring. My own preference is to pinch back the growing shoots of blackcaps and blackberries while they are still low, not over eighteen or twenty inches high. This induces them to branch and form a self-supporting bush. Such a bush is not so easily laid down for winter protection as when each cane is left unpruned; it also demands more work in the spring pruning. There is likewise a further objection, that it forms a more compact plant which does not dry out so quickly when in leaf, and is therefore apparently more subject to the spread of plant diseases. Anthracnose is more troublesome upon plants treated in this way than upon those allowed to grow as single canes. For the home garden, if a trellis is to be provided, to which the canes may be tied, it is doubtless as well to let them grow in their own way. Red raspberries give best results in either case if no summer pruning is done. It is important that this pinching be done early, for if the canes are allowed to grow tall before being cut back, the results are never so good.

The fruiting habit of the variety should be considered at the spring pruning. It should be remembered that that pruning is the fruit-thinning process with these fruits. The amount of cane left determines the amount of fruit to be borne. Some varieties differ noticeably in the position of the first fruit-bearing clusters. In some cases there may be double the number of non-producing buds at the base of the branch that will be found in others. If the grower does not know his variety, therefore, the spring pruning had best be delayed until the fruit buds show so that he can know how many buds he is leaving.

Harvesting and Marketing.

Harvesting is a small matter in the home garden but is likely to be the most troublesome of all in commercial plantations. It is absolutely essential that the commercial grower shall have a liberal supply of pickers available in order to succeed. The work is tiresome and trying, and many who begin with the best of intentions will not persist to the end of the season.

In the picking of blackberries it is important that the fruit should be kept from the sun, since exposure to the sun, after being taken from the bush, quickly turns the fruit red, greatly injuring its appearance. Another

point to be remembered with the blackberry is that for the best quality it should not be picked too soon. The fruit is not really ripe when it first turns black. In commercial practice it may be necessary to pick it then, but for home use it should be allowed to remain longer upon the plants.

Packages should be chosen with reference to the taste of the market to be supplied. People usually prefer a package to which they are accustomed, though the grower who is to work up a special, high-class retail trade may prefer a package different from ordinary ones. These fruits are easily crushed and handle best in small baskets. Red raspberries, particularly, demand pint baskets, and are sometimes sold in even smaller ones. The grower should avoid long shipments if possible. These fruits settle so badly in transportation that they appear at a great disadvantage at the end of a long journey.

Enemies.

The brambles are subject to attacks from many enemies. One which often proves troublesome upon blackberries is the bramble flea-louse, known as the "mistletoe disease" in some localities. This is a small plant-louse which attacks the tips of the growing shoots in large numbers, causing both the cane and the leaves to curl up, forming a knotted mass of foliage. The insects themselves are so well protected by this abnormal growth that they cannot be readily reached with any insecticide. About the only remedy consists in cutting off and burning these deformed tips.

Several cane-borers attack these plants, some working at the crown, others in the canes about. They, too, can only be controlled by destroying the canes before the insects have emerged, thus preventing their future multiplication. Where rose chafers are numerous, they often become a troublesome pest, and one which it is very hard to control. Thorough spraying with Bordeaux mixture and arsenate of lead will destroy many of them, but they are likely to appear at a season when it will be impracticable to use this preparation. Perhaps the best that can be done is to avoid their breeding places in the location of bush-fruit plantations. Sandy lands which are known to be infested should be avoided.

The strawberry weevil is a pest very common on wild blackberries. Its injury is done by cutting off the young fruit-buds before they open. In a count made of a number of clusters of wild blackberries one season, more than half of the buds had been thus destroyed by this insect. Practically nothing can be done to prevent its ravages. It is not likely that it eats enough in doing this work to be seriously checked by poisons. Its purpose in this operation is to hold the pollen of the unopened bud in a condition to afford food for its offspring, since the young larva feeds upon pollen. Thus far we have not experienced serious loss upon cultivated plants from these insects, perhaps because they have been located some distance from woodlands where wild blackberries grow. It is said to fluctuate greatly in numbers in different years, so that it might not always prove so troublesome even if it were to attack cultivated plants. Avoiding proximity to wild blackberry lands would seem to be a safe precaution to take.

Among the fungous diseases red rust is one of the best known. It causes the plants to look red and scaly soon after growth begins in the spring. This red color is caused by the ripening of a large number of spores upon the surface of the leaf. A plant once attacked is thoroughly diseased, since the mycelium works its way throughout the whole plant. The only remedy is to up-root and burn all such plants at once.

Another troublesome enemy is anthracnose, which causes many canker-like spots upon the canes and even leaf-stalks of the plants. These spots often become so numerous as to run together, and greatly hinder the

growth and productiveness of the plant. Diseased canes should be avoided in setting a new plantation. The simplest remedy is to replant frequently. The pest is nearly always more troublesome upon old plantations than upon young ones. With good care and frequent replanting it seldom becomes a serious handicap. Its ravages can be reduced by thorough spraying with Bordeaux mixture, but this is not as feasible as in the case of some plant diseases.

Leaf-spots sometimes cause serious injury. Bordeaux mixture will be more useful in controlling them than with anthracnose, but is not often necessary.

Another troublesome pest is the crown gall, which causes the growth of warty galls on the roots. These growths may occur just at the surface of the ground or at points further underneath. The disease is due to the work of a fungus of low order, and may be communicated from one plantation to another, or from berry plants to fruit trees. It is therefore best to exercise great precaution to avoid introducing this trouble, especially if the plants are to be set among trees in the orchard. Plants affected soon grow weak and fail to yield satisfactory results.

THE GROSELLES.

Soil and Climatic Conditions.

Like the brambles, the groselles are not sensitive to variations in soil, though best returns can be expected from a moist, fertile soil, fairly heavy. They will thrive better on clay than the brambles. They are cool climate plants and do better in cool locations, such as a north slope. Currants are frequently planted in orchards and give good results under these conditions. A wet soil is unfavorable because it tends to induce heaving in winter. Currants in particular are easily lifted and seriously injured by this cause.

These plants are particularly hardy and seldom or never suffer winter injury, at least under conditions prevalent in southern New England. They are, however, subject to injury from summer drought, though this is likely to be less serious than with the brambles, for the reason that their fruit develops earlier. A lack of moisture will reduce the size of the fruit, hence for best returns a moist soil and good cultivation should always be the aim.

Fertilizers.

Both currants and gooseberries delight in a rich, fertile soil. Stable manure is well adapted to their needs, and no commercial fertilizer will give superior results. Experiments in Massachusetts some years ago showed that the quality of the currant could be improved by the liberal use of potash. Since the fruit is developed so early in the season, nitrate of soda should prove a satisfactory source of nitrogen when chemicals must be used.

Preparation and Planting.

The preparation of the soil does not differ from that suggested for the brambles. Underdraining will prove equally important in the case of wet soils liable to heaving. This will not only avoid such injury, but also afford better moisture conditions during the season of growth.

A convenient distance for planting is six feet by four, and if planted in check-rows cultivation may go on in both directions, thereby reducing the amount of hand-hoeing to the minimum. Methods of planting are the same as for the brambles.

Among varieties of currants, there is no such unanimity of choice as with the red raspberries. No one variety seems to be best adapted to all localities. In many places, Fay is one of the best, while in others it does not seem to give good satisfaction. Cherry, while large in berry,

is likely to be small in bunch. Versailles is generally reported more reliable. Among late varieties, Victoria is one of the best and very generally successful. There are many new claimants to public favor, some of which may in time take the place of older ones.

White currants are little wanted in the market and should seldom be planted for market purposes. They are slightly sweeter than red varieties and a few may be desirable for home use.

Among gooseberries, two classes are to be considered, the American and the English types. These differ widely in their characteristics. The English gooseberry is far larger, and consequently more attractive in market, though no better in quality, if, indeed, equal to the American. It is only with exceptional care and under favorable conditions that this type will succeed in America. A few amateurs have reported excellent success with it. With us, in Rhode Island, none of the varieties of this class have proved at all satisfactory. One by one they disappear as the winters go by, and there is little to show for the effort to grow them. The gooseberry mildew is thought to be the chief enemy responsible for this failure, but not all the difference in hardiness may be due to injury from this cause. Under our conditions, the type is far less productive than the American sorts. The weak point of the American varieties is the small size of their fruit. As yet, however, this class must be depended upon under most conditions for commercial work. Downing is still our most popular and most uniformly successful variety. It is believed to contain some European blood, but the native element predominates to such an extent that it is a very hardy and reliable sort, producing fruit of fair size and excellent quality. Some of the newer sorts promise well, and may, in time, take the place of this well-tried variety. Among these, Pearl is a promising one with us.

I know of no experiments to determine the desirability of interpollination among currants and gooseberries. It is a fact, however, that many blossoms fail to set fruit, and it may be possible that interchange of pollen would prove beneficial. This failure to set fruit is frequently noticeable with the currant in short clusters, the end blossoms having failed to set.

Methods of Propagation.

Currants are among the most easily propagated of all our fruits which demand any attention at all in this regard. Currant cuttings will grow under almost any method of treatment. To propagate a few for home use, as simple a way as any is to make cuttings of the one-year-old wood early in spring and plant them directly in the soil. If done before growth starts, which must be early, a large proportion of them will root and form plants.

In more extensive planting, the cuttings are usually made in the fall, as soon as the leaves drop, or even earlier, usually about the first of September. The cuttings are made six or eight inches long and may be planted at once or tied up in bundles and buried, bottom upward, just beneath the surface of the ground. In this condition they will readily callous at the base and may be taken up and planted later. When planted they should be set with only an inch or so of the tip above the ground and be covered with a mulch during the winter. Cuttings taken at any time during the winter and buried in moist moss, earth or sawdust in a cellar will be in good condition for planting early in spring.

Gooseberries do not root so readily from cuttings as do currants, though with proper care there is little trouble in propagating the American varieties in this way. Probably one of the best ways is to take the cuttings in the fall or early winter and keep them in the cellar, as suggested for currants, until planting time, though they may be planted out in autumn in the same manner as currants.

The English varieties root with great difficulty and are therefore propagated by mound layering. This is done by banking the earth up

about the bush in spring and allowing it to remain there until roots are thrown out from the base of the branches. Some of the English sorts will require to be left in this condition for two years before being sufficiently rooted for the branches to be cut off and set out by themselves. The American varieties will form roots readily, and can be cut into separate plants the following spring after being mounded.

They may also be propagated by ordinary layering, bending a branch down and covering it with soil until it roots. This is less convenient than the other method and not so generally practised.

After-culture.

Frequent, thorough, but shallow tillage is all that these fruits demand. The roots of these plants are readily injured by implements which run deep and their use should be avoided.

The use of a cover-crop is as applicable to currants and gooseberries as to raspberries and blackberries. Several rows of currants on our own grounds had an excellent stand of mammoth clover during the past winter and spring. This was cultivated and hoed out with some difficulty after making a good start this spring. It has been noted that these plants are now making an unusually good growth. How much of this is due to the influence of the clover we are unable to say. Certainly no injury has resulted from it.

Pruning.

The pruning of currants and gooseberries is simple. When first planted, if the growth has been rapid, the branches may be shortened back at the spring pruning but under ordinary conditions the pruning consists chiefly in thinning out superfluous stalks or branches. For the first year or two the young wood may be removed, after that it is chiefly a question of removing the older parts to give place to young growth. The best fruit is always borne on the young wood. It is well, therefore, to keep a perpetual process of renewal under way, so that at no time shall there be any parts of the bush which have begun to weaken with age. As with the brambles, this spring pruning is the fruit thinning process and the amount of wood left should determine the probable amount of fruit which the plant is to bear. For exhibition purposes it may be practicable to thin individual fruits or clusters, but under general conditions thinning is done wholly by the pruning.

Harvesting and Marketing.

In harvesting currants for market purposes a particularly close watch must be kept of the pickers. The stem of each cluster should be grasped above the fruit and removed from the bush without crushing or loosening any of the berries. Only careful pickers will do this. It is so much easier to grasp the cluster of fruit as a whole and pull it away than it is to take hold of the stem alone with the thumb and finger. For this reason a variety which affords more space between the branch and the first berries of a cluster possesses an advantage. Fay is a good variety in this respect. While currants will stand shipment well if sound, they will quickly spoil when torn from the stem, and the skin broken.

Gooseberries are among the best of all our fruits to ship, since they are nearly always marketed green. They can be handled like so many beans, and will always stand up well under ordinary shipping conditions. They are, however, difficult to pick, since the plants of all of our good varieties are thorny. These thorns are stiff and strong and particularly troublesome to the pickers. One method of picking sometimes practised, which obviates the difficulty in part, is to wear gloves and strip the fruit from the bushes into trays or dishes. They are then run through a fan-

ning mill to blow out leaves and other light refuse. If picked while still perfectly green and firm this method is entirely feasible.

The five or ten pound grape basket makes a very convenient and satisfactory package for marketing these fruits, particularly gooseberries, though they are often marketed in the ordinary quart basket.

Enemies.

Among the enemies of the groselles, the San José scale should perhaps receive first mention, since it seems to be very partial to the currant as a food plant. This pest is now so thoroughly established and so generally distributed in New England that we must reckon with it as one of our standing enemies. We may be fortunate enough to escape it for a time, but are liable to meet it at any time. It can be controlled by spraying with the lime, sulphur and salt mixtures which are now so generally used, and by several other methods. The recommended methods for dealing with this pest have changed so rapidly in recent years that it is probable that we have not yet found the best plan of treatment. It is true, however, that the lime, sulphur and salt is proving an efficient remedy, though one somewhat troublesome to prepare.

Currant borers sometimes cause serious injury to these fruits. The only feasible remedy is to cut out and destroy infested stalks. When the principle of frequent renewal in pruning is followed, there is not likely to be serious loss from this pest. The older method of growing the plants in tree form, with a single stalk, rendered the possibility of damage from this insect much greater than it is under the present more general custom of allowing a number of stalks to grow from each root.

The currant fly sometimes causes serious trouble. This insect deposits its egg within the growing fruit. The larva which hatches may work from berry to berry, destroying the appearance of the cluster and rendering it practically worthless for market purposes. Unfortunately, the only remedy which seems available is to pick off and destroy infested fruits as soon as the insect is known. This, though a somewhat expensive process, may be really more feasible than at first glance it appears to be, provided help can be obtained to do the work.

The currant worms, of which there are two species, one native and the other imported, are the best known enemies of these fruits. They are, however, easily controlled. Powdered hellebore, at the rate of an ounce to three gallons of water, is an efficient and particularly feasible remedy. The eggs are usually laid near the base of the plants, and if spraying is done very early, Paris green or arsenate of lead may be used, destroying many of the worms before they spread to other parts of the plant.

Gooseberry mildew, as already suggested, is the chief enemy of the English gooseberry. It also sometimes attacks the Downing. It is a fungous disease which makes its appearance first on the leaves, covering them with a dirty grayish growth. It may later attack the fruit as well, rendering it unfit for use. Destroying the leaves as it does, it weakens the plant and prevents it from making growth or elaborating food for the next year's crop. The best and simplest remedy is thorough, frequent spraying with potassium sulphide, known also as liver of sulphur, used at the rate of one ounce to three gallons of water. This is a simpler and more effective remedy than our standard fungicide, Bordeaux mixture, though the latter is also a fairly efficient remedy.

Leaf-spot fungi are also troublesome to both the currant and the gooseberry. It is the common occurrence for these plants to lose all their leaves long before the summer is over. This greatly weakens their condition. When thoroughly sprayed with Bordeaux mixture the leaves may be held on much later, with consequent improvement in the vigor and general condition of the plant.

Profits.

Profits with any of the bush-fruits depend much upon location. Several things are essential to profitable returns. Among these are, first, favorable soil and climatic conditions; second, available help for picking; third, an available market. With these essentials given, to which must be added intelligent care and management, any of these fruits will prove fairly remunerative. Instances of exceptional profit, such as are often reported, give little estimate of probable returns, but with none of these fruits need the expense of production be unusually large, and the price obtained for good fruit is always sufficient to cover it with a satisfactory margin beside. Failures will come, as with everything else, but they need not be more frequent than in other lines. With any of these essentials lacking, however, the growing of bush-fruits for market is a hazardous undertaking.

MASSACHUSETTS CROP REPORT

FOR THE

MONTH OF AUGUST, 1905.

POULTRY HOUSING.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON :
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1905.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

CROP REPORT FOR THE MONTH OF AUGUST, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Sept. 1, 1905.

Bulletin No. 5, Crop Report for the month of August, is presented herewith. Attention is called to the article at the close of the bulletin, on "Practical poultry housing," by John H. Robinson, editor of "Farm-Poultry." This article discusses an important question in poultry management in an instructive manner, and is even more applicable to conditions on the farm than to those of exclusive poultry plants. It is supplementary to the articles by Mr. Robinson which have appeared in the August crop reports for several years past, but is also complete in itself.

PROGRESS OF THE SEASON.

The Crop Estimating Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for August, 1905) finds that the condition of corn on August 1 was 89, as compared with 87.3 a month earlier, 87.3 in 1904, 78.7 in 1903, and a ten-year average of 85.4.

Preliminary returns indicate a winter wheat crop of about 424,400,000 bushels, or an average of 14.3 bushels per acre, as compared with 12.4 bushels last year, as finally estimated.

The average condition of spring wheat was 89.2, as compared with 91 last month, 87.5 in 1904, 77.1 in 1903, and a ten-year average of 83.3.

The average condition of the oat crop was 90.8, as compared with 92.1 last month, 86.6 on Aug. 1, 1904, 79.5 in 1903, and a ten-year August average of 83.7. The proportion of the oat crop still in the hands of the farmers was estimated at 6.2 per cent, as compared with 5.4 of the 1903 crop in farmers' hands a year ago, 7.4 of the crop of 1902 in farmers' hands two years ago, and a ten-year average of 7.2 per cent.

The average condition of barley was 89.5, against 91.5 a

month earlier, 88.1 in 1904, 83.4 in 1903, and a ten-year average of 85.1.

The average condition of spring rye on August 1 was 92.6, as compared with 93 a month earlier, 91.8 in 1904, 87.2 in 1903, and a ten-year average of 87.4.

The acreage of buckwheat is less than that of last year by about 32,200 acres, or 4.1 per cent. The average condition of the crop August 1 was 92.6, as compared with 92.8 in 1904, 93.9 in 1903, and a ten-year average of 91.4.

The average condition of flax was 96.7, as compared with 92.7 a month earlier and 78.9 in 1904.

The average condition of tobacco was 84.1, as compared with 87.4 a month earlier, 83.9 in 1904, and a five-year average of 82.9.

The average condition of potatoes was 87.2, as compared with 91.2 a month earlier, 94.1 in 1904, 87.2 in 1903, and a ten-year average of 86.6.

Preliminary returns indicate a decrease of 1.6 per cent in the hay acreage. The average condition of timothy hay on August 1 was 90.2, as compared with 94 in 1904, 92.2 in 1903, and a nine-year average of 87.1. Reports as to the production of clover are, on the whole, favorable, and the quality of the crop is indicated as of high medium grade.

The average condition of pasture was 96.1, as compared with 97 a month earlier, 95.5 in 1904, 94.9 in 1903, and an eight-year average of 88.2.

The average condition of rice was 92.9, as compared with 88 a month earlier and 90.2 in 1904.

The condition of cotton on July 25 was 74.9, as compared with 77 a month earlier, 91.6 in 1904, 79.7 in 1903, and a ten-year average of 82.6.

In Massachusetts the average condition of corn was 93; the average condition of oats 97, and the proportion of the crop of 1904 still in farmers' hands 4 per cent; the average condition of spring rye 97; the acreage of buckwheat as compared with last year 96, and the average condition 95; the average condition of tobacco 88; the average condition of potatoes 87; the acreage of hay compared with last year 99; the average condition of timothy hay 88; the production of clover as compared with a full crop 88; and

the quality 93; the average condition of pasture 86; the average condition of apples 63; the average condition of peaches 71; and the average condition of grapes 77.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM WEATHER-CROP BULLETINS OF THE UNITED STATES WEATHER BUREAU.]

Week ending July 31.—Along the immediate south Atlantic and Gulf coasts and over the greater part of Texas the temperature of the week averaged nearly normal. The week was warmer than usual over the middle Plateau and north Pacific coast regions, except in north-western Washington. In central and southern California, the southern Plateau region, and in all northern and central districts eastward of the Rocky Mountains, the temperature was below the normal, the week averaging decidedly cool in the central valleys and Lake region. The upper Mississippi and central Ohio valleys, the southern portion of the Middle Atlantic States, and portions of the South Atlantic and Gulf States received less than the average rainfall during the week. Over the northern portion of the Middle Atlantic States, a large part of the Lake region, and from Arkansas north-westward over south-western Missouri, eastern Kansas, south-eastern Nebraska, and generally throughout the eastern Rocky Mountain districts, the rainfall exceeded the average.

Week ending August 7.—The week was warmer than usual in the central valleys, Gulf States, Rio Grande valley, and the northern Plateau and north Pacific coast regions. Generally throughout the Lake region and Atlantic coast districts, over the Middle Rocky Mountain slope, and in California, Nevada and Utah, the temperature averaged below the normal, the deficiency ranging from 3° to 6° per day over portions of the Lake region. There was more than the usual rainfall in most of the Lake region, in portions of the Missouri, central Mississippi and Ohio valleys, over the northern portion of the central and west Gulf States, along the east Gulf coast, and in Florida. In the lower Missouri valley and in Florida the total for the week ranged from 2 to 7 inches. In nearly all districts on the Atlantic coast northward of Florida the rainfall was below the average, and

a large part of the Middle and South Atlantic and east Gulf States received no appreciable amount.

Week ending August 14. — The week was slightly cooler than usual along the central and east Gulf coasts, in western Washington, southern California, and over the southern Plateau and central Rocky Mountain regions. Throughout the Atlantic coast districts, Lake region, central valleys and over the northern Rocky Mountain and Plateau regions the week was warmer than usual, the daily temperature excess generally averaging from 3° to 6° in all northerly districts. The rainfall was excessively heavy from southern New England to the central portions of the middle and east Gulf States. Heavy rains also occurred in the Ohio valley and in portions of the upper Mississippi, upper Missouri and Red River of the North valleys. The rainfall was lighter than usual over a large part of the Lake region, northern New England, the interior of the Middle Atlantic States, and in the lower Missouri valley.

Week ending August 21. — The week was cooler than usual in the Atlantic coast districts, Ohio valley, southern portion of the Lake region, and from the northern portion of the upper Mississippi valley to the north Pacific coast. The week was decidedly cool in southern New England and the northern part of the Middle Atlantic States, where the deficiency ranged from 3° to 5° per day. In the central and west Gulf districts, lower Missouri valley, and over the southern Plateau region and middle Rocky Mountain slope the temperature averaged above the normal. The rainfall was largely in excess in Florida, from Arkansas and Indian Territory northward to Manitoba, in the upper Ohio valley, the lower Lake region, and the greater part of the upper Lake region and New England. There was less than the average in portions of the upper Mississippi and lower Ohio valleys and over the greater part of the South Atlantic States.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending July 31. — New England. Boston : Weather favorable in southern portion, but too cool in northern portions ; showers Saturday and Sunday very beneficial, but more

moisture generally needed; crops in good condition; corn silking; rye harvested, good yield; barley harvest begun; oats being cut for fodder; potatoes generally good, but some blight; haying about completed, good crop; tobacco promising; apples poor; other fruits plentiful.

Week ending August 7. — New England. Boston: Weather favorable for crops and harvesting; corn greatly improved and promising; oat and barley harvest well advanced; rye harvested, good yields; potatoes and all garden vegetables show marked improvement and promise well; tobacco topped and cutting begun, plants of good color; apples poor, other fruits plentiful; haying completed; pastures generally revived.

Week ending August 14. — New England. Boston: Weather favorable; ample moisture, except in northern portion; corn developing rapidly; oats and barley good crops and nearly all harvested; second growth of grass and late sown fodder greatly improved; pastures revived, and promising ample fall feed; garden truck plentiful; potatoes fine crop generally; tobacco very good, cutting well advanced; berries abundant; pears and peaches fair; winter apples scarce.

Week ending August 21. — New England. Boston: Weather too cool for maturing crops; ample rainfall; corn made slow progress; barley harvest completed, yield good; oat and wheat harvest well advanced, excellent results; buckwheat making good growth; garden truck being marketed in large quantities; potatoes rusting, but no rot reported; fruit, except apples, good crop; tobacco outlook best in years, cutting well advanced.

THE WEATHER FOR AUGUST, 1905.

The month opened cloudy and cool, with local showers and thunderstorms, which continued through the 2d. The rainfall, however, was generally in light amounts, of less than .1 inch. Following the 2d there was nearly a week of fair weather, with generally clear skies and much sunshine; the temperature also ranged higher, rising to maxima of 80° to 87° during the day. These conditions prevailed until the 8th, when the weather became unsettled and partly

cloudy to cloudy, with local showers and thunderstorms, these conditions continuing until the 13th. The rainfall during this period was generally copious, although somewhat irregularly distributed, some points having only light or moderate amounts, and others 1 inch or more. The temperature ranged higher than heretofore during the month, with maxima near 87° , which, with the high humidity from the showers, made the atmospheric conditions particularly uncomfortable and oppressive. On the 13th and 14th clear, pleasant weather, with moderate temperature, prevailed. On the 15th the weather again became stormy, with heavy showers during the afternoon and night, covering the entire State, with amounts from .50 to 2 inches. The weather cleared during the afternoon and night of the 16th, after which date fair and generally clear weather prevailed until the evening of the 24th, excepting brief intervals of cloudiness and scattered light showers from local thunderstorms on the evenings of the 20th and 22d. On the night of the 24th and morning of the 25th light to moderate rains occurred, followed by clearing weather by evening of the 25th, and fair, generally clear weather during the greater portion of the remainder of the month. The temperature on and after the 14th was generally moderate for the remainder of the month, except on the 22d, 23d and 24th, when it rose to maxima of 90° . For the month as a whole the temperature was nearly normal, the rainfall somewhat below normal, but not sufficiently so as to cause injury from absence of moisture; the amount of sunshine was above the average, nearly half the days of the month being clear, or generally so.

In our circular to correspondents, returnable August 23, the following questions were asked:—

1. What is the condition of Indian corn?
2. Is sweet corn raised for canning in your locality, and if so, what is its condition?
3. What is the prospect for rowen, as compared with a normal crop?
4. What is the prospect for late potatoes, and have you noticed blight or rot?

5. How do the acreage and condition of tobacco compare with former years?

6. What is the prospect for apples, pears, peaches, grapes and cranberries?

7. What is the condition of pasturage in your vicinity?

8. How have oats and barley compared with former years?

Returns were received from 166 correspondents, from which the following summary has been made:—

INDIAN CORN.

Indian corn made rapid advances in condition with the favorable weather of a greater part of the month, and at its close was very nearly up to the normal, though probably still a little backward in setting and maturing the ears. There are some complaints that it is not earing out well, though there is a good growth of stalk, but these form the exception rather than the rule. Ensilage corn has made good progress, and should yield unusually well.

SWEET CORN.

Only two correspondents—those for Bernardston and Northfield, Franklin County—report that sweet corn is raised for canning. It forms quite an extensive crop for the market and home use, and is also a favorite late forage crop. Some growers combine these uses with excellent results. The condition of the crop is everywhere reported as excellent.

ROWEN.

Owing to lack of rain after the cutting of the first crop, rowen will not be up to the normal in most sections. Only new-seeded fields and rich, moist lands show favorable yields, and on old mowings there will generally be practically no rowen. Reports from Cape Cod show a marked exception in that section, where the rowen crop will be much better than usual. Cutting has not yet begun, so far as reported.

LATE POTATOES.

The returns indicate that late potatoes will be considerably below a normal crop, not having set well in many in-

stances, and again having suffered severely from drought. Blight has appeared in many localities in all sections of the State and some rot is reported. As rot usually follows blight, it is feared that it will be generally prevalent before harvesting is completed. Spraying with some fungicide would save the farmers of the State many thousands of dollars in most years.

TOBACCO.

There would appear to be a slight increase in the acreage of tobacco this season. The condition of the crop is said to be excellent, with a broad, fine leaf, that promises excellent quality. A severe hailstorm is reported to have damaged the crop in one section, but only a small portion of the crop was affected. Cutting was well under way at the time of making returns, and will be practically completed by the first of September.

PASTURAGE.

In most sections pastures are reported to be in unusually good condition for the time of year, and with seasonable rains should continue green and give plenty of feed until well into the autumn.

FRUITS.

Apples have dropped badly, but should still give rather better than an average crop for a non-bearing year. Pears will be only a light crop in most sections. Peaches promise an unusually heavy yield, but appear to be somewhat late in maturing. Grapes have set well where the vines survived the winter, and promise a heavy yield. Cranberries appear to have suffered from a variety of causes — winter-killing, spring frosts and insect damage — in the sections of principal production, and only a light crop will be secured.

OATS AND BARLEY.

Oats are a heavy crop where raised for grain. Practically no barley is raised for grain, all being fed green or going into the silo, and it has done well in those capacities. Oats are also largely used as a soiling crop and for hay.

NOTES OF CORRESPONDENTS.

(Returned to us August 23.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — There is a better growth of Indian corn than for the past two years. Sweet corn is raised to some extent, but not for canning. There will be a short crop of rowen, by reason of dry weather and late cutting of first crop. No blight or rot on potatoes, but crop short, owing to drought. Apples will be a light crop; some peaches. Pastures are rather short. About an average crop of oats has been harvested. Flies have troubled cows badly, and the advertised remedies are only partial successes.

Alford (LESTER T. OSBORNE). — Indian corn is rather above the average in condition. Sweet corn is little raised for canning; condition good. Rowen will be about half a crop, owing to drought. Late potatoes will be a light crop, but show no blight. Early apples good, winter varieties about half a crop. Pasturage is in very poor condition. Oats and barley are better crops than for some time. Water very low, and many wells dry.

Lee (A. BRADLEY). — Indian corn is in first-class condition. Sweet corn is not raised for canning. Rowen will give two-thirds of a normal yield. Late potatoes are nearly a full crop; no rot as yet on late varieties, but early ones rotted very badly. Apples will be half a crop. Pastures are in good condition. Oats and barley are full crops.

Hinsdale (THOS. F. BARKER). — Indian corn is very backward and uneven. Sweet corn is not raised for canning. Rowen will be a short crop, on account of dry weather after first cutting. Potatoes promise a fair crop; no blight as yet. Apples and pears will give fair crops; no peaches; few grapes and cranberries. Oats and barley are very heavy crops; barley little grown.

Becket (WM. H. SNOW). — Indian corn will be a good crop if frost holds off. Sweet corn is not raised for canning. Rowen will be an average crop. Late potatoes will not be a good crop, because of blight and rot. There will be light yields of apples and

pears, and no cranberries. Pasturage is in fairly good condition. Oats and barley were good average crops. There was a light crop of hay, but rowen started very quickly. Many crops are suffering from weeds.

Windsor (H. A. FORD). — Indian corn is late, but in good condition. Sweet corn is not raised for canning. Rowen never looked better. There will not be a large crop of late potatoes, and blight has struck them. Apples are a good crop, but not as plenty as last year. Pastures are in good condition. Oats and barley are fully up to the normal.

Hancock (B. H. GOODRICH). — Indian corn is looking well. Sweet corn is not raised for canning. Rowen will be a small crop, as haying was finished late. Late potatoes will be a light crop; vines have blighted badly, but little rot has been found as yet. Apples will be a light crop; peaches not grown; grapes about average; cranberries not raised here. Pasturage is good for the time of year. Few have threshed oats and barley as yet, but those report about average yields.

Cheshire (L. J. NORTUP). — Indian corn promises to be a normal crop. Sweet corn is not raised for canning. Rowen will be a normal crop where the first crop was cut early. Late potatoes are a good crop; no blight or rot noticed. Apples are no more than a one-fourth crop; fair outlook for pears. Pastures are getting short, and some are feeding green feed. Oats are a first-class crop; barley not grown here.

Williamstown (S. A. HICKOX). — Indian corn will be 90 per cent of a full crop. Sweet corn is not raised for canning. Rowen will be nearly a full crop. The prospect for late potatoes is poor, and blight and rot have appeared. Apples will give about a third of a normal crop; other fruits half crops. Pastures are in good condition. Oats were nearly a full crop and barley a two-thirds crop.

FRANKLIN COUNTY.

Charlemont (J. M. J. LEGATE). — Indian corn is backward, probably two weeks behind the normal. Sweet corn is not raised for canning. Rowen will give three-fourths of a normal crop. Late potatoes now promise only a light crop; complaint of their not setting well, and some blight. Apples and pears half crops; peaches a full crop. Pasturage is in good condition. Oats and barley are little raised for grain, being principally used as soiling crops.

Colrain (A. A. SMITH). — Indian corn is in good condition. Sweet corn is not raised for canning. Rowen will not be a normal

crop. Blight and rot have appeared on late potatoes. Tobacco is fully equal to last year, though not much raised. The prospect is not good for fruits. Pastures are in fairly good condition. Oats and barley are better crops than usual.

Bernardston (R. H. CUSHMAN). — Indian corn is looking well, though from a week to ten days late. Picking sweet corn for canning will begin next week. Rowen will be a fair crop on moist and new-seeded mowings. Late potatoes are all right so far, though there are not many in the hill. Apples and grapes are in fair supply; not many pears or peaches. Pastures have improved since the recent rains. Very good crops of oats are reported, but a large part of the oat crop is hayed.

Ashfield (CHARLES HOWES). — Indian corn has generally made a very good growth, but is late. Sweet corn is not raised for canning. Rowen is rather light, except on moist land. Potatoes are looking finely, with little blight as yet. Tobacco is but little raised. Apples are a very light crop, also pears; peaches a good yield. Pastures are very good for August, showers keeping them green. Oats and barley are cut for hay, and were very good. All crops are doing well now.

Deerfield (H. A. WELLS). — Indian corn is in good condition, and earing heavily. Sweet corn is grown only as a forage crop. Early cut fields show an average crop of rowen, but late cut are very light. Blight has appeared on some fields of potatoes; yield light, though tubers are of good size. There is a small increase in the acreage of tobacco; condition mostly perfect, though harvesting will be ten days late. Apples have blown from the trees; pears and peaches light; grapes a good crop. Pasturage is short. Oats and barley little grown except as forage crops.

Montague (C. S. RAYMOND). — August has made a great change in Indian corn, and if the weather continues favorable there will be a good crop. Sweet corn is not grown for canning. There will not be one-fourth of an average crop of rowen. Tobacco is little grown, but is about average in condition. Apples will be a light crop; other fruits about a failure. Pastures have not been very good this season, but the late rains have improved them somewhat. Oats and barley are not raised for grain.

Northfield (T. R. CALLENDER). — Indian corn is in fine condition, well advanced and heavily eared. Sweet corn for canning is above the average in condition. There will be a small crop of rowen, as haying was late. Late potatoes are looking well; but early ones show blight. There is a small acreage of tobacco, but it is looking finely. Apples are a fair crop for an off year. Pasturage is in good condition. Oats and barley are fully up to the

average. All garden crops have been excellent, with fair prices. Cucumbers for pickles are beginning to show rust; season short.

Erving (CHARLES F. CLARK). — Indian corn is in good condition. Sweet corn is not raised for canning. There is prospect of a good crop of rowen. Late potatoes promise a fair crop, with no blight or rust as yet. There will be a light crop of fruit. Pastures are in good condition for the time of year. Oats and barley are about average crops.

Orange (A. C. WHITE). — Indian corn is growing finely, but is a little late, owing to a late start. Rowen promises to make a good yield. Late potatoes look finely, with a big growth of tops, but the yield is small. There will be a scarcity of fruit. Pasturage is in normal condition. Everything is looking finely now and growing well, and will do well if frosts are not too early.

HAMPSHIRE COUNTY.

Belchertown (H. C. WEST). — Indian corn promises a full average crop at present. Sweet corn is not raised for canning, but the little raised is in good condition. The prospect for rowen is very poor; but few good fields seen. The prospect for late potatoes is fair; some blight, but no rot as yet. Small crop of apples; few pears; peaches and grapes good. Pasturage is very short. Oats a fair crop; barley not as good. Crops as a whole are not up to the average.

Pelham (JOHN L. BREWER). — Indian corn is in excellent condition, but somewhat backward. Sweet corn is not raised for canning, but is in very good condition. Rowen is short, and there will not be much on old fields. There is good prospect for late potatoes; no blight as yet. Tobacco is little raised. Most kinds of fruit are short in quantity and quality. Pasturage is very short. Oats were a good crop, but they were housed with difficulty. The recent showers have been very acceptable, but springs and wells are still low.

Hadley (H. C. RUSSELL). — Indian corn is in excellent condition. Sweet corn is not raised for canning. Rowen will not be over half a crop, as the first crop was cut late. There is an increase of 5 per cent in the tobacco acreage, and the condition is well up to the average, except for damage by hail in one locality. Apples will be a light crop; pears and grapes average. Pastures are in good condition. Oats and barley are about normal crops.

South Hadley (W. F. PERSON). — Indian corn is a very good crop, and is earing out well. All the sweet corn raised goes to the local market; none for canning. Rowen will not give a half

crop. Potatoes will be below the average in yield; no blight or rot as yet. Apples are a light crop; pears and grapes good. Oats are a good crop. This has been a hard season to make milk, as the pastures have been poor from the start in the spring, and there was but a three-fourths hay crop.

Southampton (C. B. LYMAN). — There is a good growth of Indian corn, and the ears are well set. Sweet corn is not raised for canning. Rowen will be a light crop. Potatoes look well, but blight is beginning to show on some fields. Tobacco acreage about the same as usual, but condition never better. There will be a fair crop of apples; pears plenty; peaches few; grapes full. The rains have improved the pastures. Oats made a good growth, and were mainly cut for hay; no barley raised.

Williamsburg (F. C. RICHARDS). — Indian corn looks well, but is backward in maturing. Sweet corn is not raised for canning. Rowen will hardly be an average crop. Yield of late potatoes not heavy but good; some blight, but no rot as yet. Acreage of tobacco about the same as usual, and condition above average. Apples and pears half a crop; peaches 80 per cent of a full crop. Feed in pastures is still good, but they are getting quite dry. Oats and barley are full average crops, except on light, dry soils.

Huntington (H. W. STICKNEY). — Indian corn is in fine condition. Sweet corn is not much raised for canning. There is seldom such a heavy growth of rowen. Blight has appeared on some fields of potatoes, but no rot as yet. Tobacco is little raised. Apples are a light crop; grapes looking finely. Pastures have improved since the recent showers. There is a fine growth of oats and barley.

Chesterfield (HORATIO BISBEE). — Indian corn never looked better than at the present time. Sweet corn is not raised for canning. Rowen is doing well now, and will be an average crop a little later. There is a fair prospect for late potatoes, with neither blight nor rot. Apples will not give a very good crop. Feed in pastures is pretty good. Stock is looking well, though flies are causing much trouble. Oats and barley are very fair crops.

Huntington (C. K. BREWSTER). — Indian corn is quite promising. Sweet corn is not raised for canning. There will be about a normal crop of rowen. There is a great growth of potato vines, but the yield is light. There will be a fair crop of apples; other fruits light. The recent rains have helped the pastures, and they are in good condition. Gardens have produced well.

Middlefield (J. T. BRYAN). — Indian corn is in good condition. Sweet corn is not raised for canning. Rowen will be an average crop. Late potatoes promise fairly well, with little sign of blight.

Apples will be a light crop; other fruits abundant. Pasturage is in excellent condition. Oats and barley were full crops.

HAMPDEN COUNTY.

Chester (C. Z. INZELL). — Indian corn is in good condition, but is a little late. Rowen did not start well, owing to dry weather after haying, but is doing well now. Blight has appeared on some fields of potatoes. Apples and peaches will give good crops. Pastures are better than a month ago.

Blandford (ENOS W. BOISE). — The warm weather has forced Indian corn along, and there will be a fair crop of grain if frosts hold off until the middle of September. Sweet corn is not raised for canning. There will be no rowen, except on rich, early cut fields. There will be a poor yield of late potatoes; some blight has appeared, and rot will follow. Apples will be a fair crop, and are of good size and fair. Stock is not doing as well as usual, on account of short pasturage and annoyance from horn flies. Oats and barley were full average crops.

Granville (JOSEPH WELCH). — Indian corn is in fair condition. Sweet corn is not raised for canning. Rowen will be a light crop, owing to dry weather. Late potatoes are looking fairly well; early ones struck by blight, and will be a light crop. Not over ten acres of tobacco in town, but that is the best for years. Apples are a failure. Feed in pastures is poor. Oats and barley were very good crops. We have had very little rain this season.

West Springfield (W. S. BAGG). — Indian corn looks finely. Sweet corn is not raised for canning. Rowen has improved of late, owing to occasional rains, but will be a small crop. Late potatoes will be a light crop. Tobacco looks well. Apples and peaches will be light crops; pears and grapes good; no cranberries. Pasturage is in very poor condition. Oats and barley are about average crops. Springs and streams are very low, and pastures have suffered severely from lack of rain.

Agawam (J. G. BURT). — Indian corn is in good condition. Sweet corn is not raised for canning. The rowen crop will be light. There will be a light crop of late potatoes, but there is as yet no blight nor rot. Acreage of tobacco about the same as usual, and condition good. There will be a light crop of all kinds of fruit. Pastures are short. Oats and barley gave about normal crops.

East Longmeadow (JOHN L. DAVIS). — Indian corn is in very good condition. Sweet corn is not raised for canning; condition good of that raised for market. There is very little rowen to be

cut. Late potatoes promise only a small yield; some blight, but no rot as yet. There will be a light crop of all fruits. Pasturage is very short and dry. Oats were a good crop; no barley raised.

Hampden (JOHN N. ISHAM). — Indian corn is doing well, with favorable conditions. Ensilage corn is making a good growth. Sweet corn is not raised in quantity. There will be but a light crop of rowen. Late potatoes show some signs of blight, but they show more effects of dry weather, except on moist lands; vines ripening prematurely. Apples will be a light crop; pears fair; where peaches are well cared for, the trees are bearing well. Pasturage is in fair condition, but many springs are short of water. Oats have been a good crop.

Monson (F. D. ROGERS). — Indian corn is somewhat late, but is otherwise in excellent condition. The season has been too dry for rowen. Late potatoes show some blight, but have not been damaged much as yet. There is a very light crop of apples, and of poor quality; grapes are rotting badly; pears fair; peaches much better than usual, and of fine quality. Pasturage is in very poor condition. Oats made a good growth, but were nearly all cut for hay.

Holland (FRANCIS WIGHT). — Indian corn is in good condition, but is backward. Sweet corn is not raised for canning. The prospect for the rowen crop is very poor. Potatoes are looking fairly well; no blight as yet. Apples will be a small crop; pears fair; peaches, grapes and cranberries light. Pastures have improved since the rains. Oats and barley gave about normal crops.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — Indian corn is in fair condition. Sweet corn is not raised for canning. There is no rowen whatever, except on low, moist land. The prospect is not very good for late potatoes, and a few cases of blight have appeared. There will not be more than 10 per cent of an average crop of fruit. Pasturage never was in worse condition. Oats and barley are average crops.

Leicester (H. H. KINGSBURY). — Indian corn has made a fine growth, and is thrifty and of good color. Sweet corn is not raised for canning. The prospect is good for a full average crop of rowen. Some fields of potatoes show signs of blight. Apples and pears will give sufficient yields for home use. Pasturage is short, as is usual in August, but green and growing. Oats and barley made rank growths, and were cut and cured for fodder.

North Brookfield (JOHN H. LANE). — Indian corn has made a

splendid growth. Sweet corn is not raised for canning. There will be a very short crop of rowen. Late potatoes promise to be better than early ones. Apples will give about a one-fourth yield; pears 15 per cent; grapes half a crop. Pastures are short and dry. Oats and barley were extra crops.

Oakham (JESSE ALLEN). — Indian corn is in fine condition. Sweet corn is not raised for canning. There will be about half a crop of rowen. Late potatoes are looking well; no blight or rot as yet. Very few apples, pears or peaches; grapes abundant. Pastures are in fairly good condition. Oats and barley were full average crops.

Barre (JOHN L. SMITH). — Indian corn is in good condition. Sweet corn is not raised for canning. There will be about an average crop of rowen. There is no blight as yet on potatoes, and the crop is extra heavy. There will be a good crop of apples for the off year. Pasturage is in extra good condition for the time of year. Oats have not made as heavy a growth as usual; barley not raised.

Hubbardston (CHAS. C. COLBY). — Indian corn promises the largest crop since 1902. The rowen crop will be much above the average. Potatoes are looking well, and there are no complaints of rot. There will be a fair crop of apples for an off year. Pasturage is holding out well, and stock is in good condition. Oats and barley are little raised for grain, but those sown for forage have made heavy growth.

Royalston (C. A. STIMSON). — Indian corn is in fine condition. Sweet corn is not raised for canning. A fair crop of rowen will be secured. Potato vines look well, with no blight or rot as yet. Grapes are a fair crop; other fruits one-fourth crops. Pastures are in fair condition. Oats and barley were normal crops.

Ashburnham (E. D. GIBSON). — Indian corn is backward and uneven, and the nights are too cool for its best development. Rowen is about an average crop. Early potatoes are a light yield of fine quality, and the later ones are growing fast and free from blight. Apples light; pears fair; a few peaches; grapes good; cranberries fair. Pasturage is in good condition. This has been a good year for oats; little barley grown.

Gardner (A. F. JOHNSON). — Indian corn is growing finely, and will make a good crop. Sweet corn is not grown for canning. Rowen will be a two-thirds yield. There will be a light yield of late potatoes. There will be but a small crop of apples, of very poor quality. Pasturage is in good condition. Oats and barley have been good average crops.

Princeton (A. O. TYLER). — Indian corn is very late, and with

early frosts little of it will ripen. Sweet corn is not raised for canning. Rowen will be a little better than a normal crop. Late potatoes promise a fair crop, but there is some blight where they have not been sprayed. Pears, peaches and grapes good; apples a small crop. Pastures are in very good condition. No oats or barley raised for grain; oats for fodder yielded well.

Lancaster (S. C. DAMON). — Indian corn promises a full crop. Sweet corn is not grown for canning. The prospect for the rowen crop is not good. Late potatoes promise good crops, and there is no blight or rot as yet. There will be but few apples; pears and grapes good. Pasturage is very short. Oats and barley are not grown except for soiling.

Holden (CHAS. E. PARKER). — The ideal weather has brought Indian corn to an average growth. Sweet corn is not raised for canning. There will be a light crop of rowen. Both blight and rot have appeared on late potatoes. Pears and peaches are good crops; apples half a crop. Oats are an excellent crop; barley grown mostly for a late forage crop.

Shrewsbury (FRED J. REED). — Indian corn is in good condition. Sweet corn is not raised for canning. Rowen promises to give a very good crop. Late potatoes are very good, with no blight or rot as yet. The fruit crop will be very light. Pasturage is in good condition. Oats and barley are about average crops, and looking very well.

Southborough (E. F. COLLINS). — Indian corn is very late, but will give a good crop if it has time to mature. Sweet corn is raised for market, and is yielding well. There will be a full average crop of rowen. Potatoes are yielding well, with no blight or rot. There will be a full crop of apples, and they are fair and nice, but late. Pasturage is in very good condition, better than usual at this time of year.

Auburn (WM. GILBERT). — Indian corn is looking well. Sweet corn is not raised for canning. The weather has been too dry for a full crop of rowen. Late potatoes promise a full crop; no blight or rot. Apples very light; pears a full crop. Pastures are short of feed. Oats and barley are about average crops.

Oxford (D. M. HOWE). — Indian corn is in good condition. Sweet corn is not raised for canning. Rowen will give an average yield. Late potatoes promise well, and there is as yet neither blight nor rot. Apples will give a good crop; no peaches. Pasturage is in fair condition. Oats and barley have given good average crops. Farmers have had an average year in general.

Blackstone (O. F. FULLER). — Indian corn is in good condition. Sweet corn is not raised for canning. Rowen will give about an

average crop. The yield of potatoes will not be up to the normal. There will be no apples to speak of; pears, peaches, grapes and cranberries fair crops. Pasturage is dry and short. Oats and barley are little raised for grain, but have done well as forage crops.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Indian corn is in good condition and looking well. Sweet corn is not raised for canning. There is not much growth of rowen as yet, and it will need a long season to amount to much. Potato vines look well; no blight or rot as yet. Apples poor; pears, peaches and grapes plenty. What little pasturage there is about here is in poor condition. Oats and barley are not raised.

Framingham (J. S. WILLIAMS). — Indian corn has made rapid growth, and the crop is fully up to the average. No sweet corn is raised for canning, but considerable for the market. On new fields the rowen crop will be fair. As a rule potatoes are yielding poorly, rather below a normal crop. For an off year there is a fair crop of apples; grapes scarce; some pear orchards good. Frequent showers have kept the pastures in good condition. Oats and barley are sown almost wholly for forage, and satisfactory crops have been secured.

Marlborough (E. D. HOWE). — Indian corn is a full crop. Sweet corn is not raised for canning, but that raised for market is in good condition. There will be a normal crop of rowen. The prospect for late potatoes is good; no blight nor rot as yet. Apples 40 per cent; pears 60 per cent; peaches 90 per cent; grapes 80 per cent. Pasturage is good for the time of year. Oats and barley are full average crops.

Maynard (L. H. MAYNARD). — Indian corn never looked better at this time of year. Sweet corn is in fine condition, but not raised for canning. The prospect is good for a fair crop of rowen. Potatoes promise well; no blight or rot as yet. Apples will be short and pears plenty. Pastures are short, but recent rains have helped out considerably. Oats are grown for fodder, and have yielded well.

Littleton (GEO. W. SANDERSON). — There is a small acreage of field corn, and a large proportion of it is for the silo, but all is looking well. Sweet corn is not raised for canning. Late rains have improved rowen greatly, and a normal crop is now promised. The prospect for late potatoes is good; have not noticed blight or rot. Apples will be a light crop; pears fair; peaches light, also grapes and cranberries. Pasturage is much improved by the late rains. Oats and barley compare favorably with former years.

Pepperell (W. F. DENNEN). — Indian corn is in very good condition, with a large acreage planted. Sweet corn is not raised for canning. Rowen is in very good condition. There are few late potatoes in this section; no blight as yet. Apples are few and small; pears, peaches, grapes and cranberries are not raised here. Pasturage is very short. Oats and barley are full average crops.

Westford (J. W. FLETCHER). — Field corn is in good condition. Sweet corn is not raised for canning. There will be no rowen at all, as it has been too dry. Late potatoes are better than early ones, and there is as yet no blight or rot. There will be better than an average crop of fruit of all kinds. Pasturage is in poor condition owing to dry weather.

Chelmsford (PERLEY P. PERHAM). — Indian corn will be a good crop, if frost holds off. Sweet corn is not raised for canning, only for market use. There will be an average crop of rowen, and a large one with further rains. Early potatoes are a good crop; no blight or rot on late ones as yet. Apples promise well; pears, peaches and grapes average. Pastures are looking much better since the late rains. Oats and barley were large crops, but mostly used for fodder.

Carlisle (E. J. CARR). — Field corn has made a good growth. Sweet corn is all sold in the market, and is in good condition. There will be a light crop of rowen. There are not many potatoes raised; no blight or rot as yet. Apples poor; pears, peaches and grapes good. There is a full crop of oats, barley and all forage crops. Pasturage is about an average for the time of year.

Concord (WM. H. HUNT). — Indian corn is looking very well. Sweet corn is not grown for canning. There will be a moderate crop of rowen. No blight or rot as yet on late potatoes, but the crop will be light. Few winter apples; some pears and peaches. Pasturage about average, as the late rains have helped it. Oats and barley have been average crops.

Tewksbury (G. E. CROSBY). — Field corn is in good condition. Sweet corn is not raised for canning. There will be a poor crop of rowen. Some fields of late potatoes are good and others blighted. Apples are about one-third of a crop; few pears and peaches; no grapes or cranberries here. Oats and barley are generally raised for fodder, and as such have been good crops.

Stoneham (J. E. WILEY). — Indian corn has been ruined by the heat. Sweet corn is not raised for canning. The rowen crop will be light. Late potatoes will yield well on low ground; no blight nor rot as yet. Apples and pears are in poor condition, and grapes promise fairly well. Pastures are dry and short.

Arlington (W. W. RAWSON). — The condition of vegetables is

not as good as usual, owing to the very dry season; if plenty of rain comes soon, the fall crops will be good, but there will be a light crop of celery.

Weston (HENRY L. BROWN). Very little Indian corn is raised here. Sweet corn is not raised for canning. Only on low, moist land is there any rowen, and on many fields the grass has been killed out by the hot, dry weather. Have noticed no blight on late potatoes, but the crop is very poor, almost a failure. There are few apples except fall kinds, and they are dropping badly; pears and peaches fair; few grapes. Pasturage is rather short, but has held out well, considering the dry weather. Oats and barley are grown only for forage and have been fair crops. The rain last week helped crops very much, but the ground is now as dry as ever. Sweet corn has been injured by the continued drought, and does not give a full yield. Squash vines are looking finely, but the set is backward.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Field corn is looking finely, and more was planted than usual. Sweet corn is not raised for canning. Rowen will be a very light crop. Late potatoes are looking well, except on high ground; no rot as yet. There will be a good crop of apples; pears fair; peaches good; grapes light. The pastures have been in rather poor condition, but the late rains started them up nicely. Oats and barley are not raised except for fodder. Early potatoes were a light crop. Cabbages are looking well.

Haverhill (EBEN WEBSTER). — Field corn is in good condition. Sweet corn is not raised for canning. Rowen will hardly be up to a normal crop. Late potatoes are looking well, and I have heard of no blight or rot. Apples will be two-thirds of the usual crop; pears short; grapes plenty. Pasturage is in very fair condition. Oats and barley are not raised.

Rowley (D. H. O'BRIEN). — Indian corn is in good condition. Sweet corn is not raised for canning. The prospect for rowen is quite good. Late potatoes are yielding well, but have blighted badly. There will be rather a light crop of all fruits except pears, which are plenty. Pasturage is in rather poor condition. Oats and barley are about normal crops.

Andover (MILO H. GOULD). — Indian corn is not quite up to the average in condition. Sweet corn is not raised for canning. The rowen crop is not as good as usual. Late potatoes are looking well, and I have not noticed blight or rot. Apples and pears light; peaches good; grapes poor; cranberries light. Pastures

are in about average condition. Oats and barley are below average crops.

NORFOLK COUNTY.

Randolph (RUFUS A. THAYER). — Indian corn promises a good crop. Sweet corn is not raised for canning. Rowen will be less than a normal crop. Late potatoes are not a good crop, although there is no blight or rot as yet. Apples, peaches and grapes are not average crops. Pasturage is in about the usual condition at this season of the year. Oats and barley were good crops, and mostly used for fodder.

Canton (EDWIN V. KINSLEY). — Corn is in very good condition, but is principally raised for the silo. Sweet corn is grown only for the market. The outlook for the rowen crop is very poor. Late potatoes look well; have not seen or heard of blight. Apples very light; all other fruits very good. Pastures are pretty well dried up. Oats and barley have done well as forage crops; not raised for grain. Some farmers report that their cows have done and are doing nicely, others that they are doing very poorly; quite a marked divergence.

Walpole (EDWARD L. SHEPARD). — Indian corn is fair, but rather late. No sweet corn grown for canning. There will be only a light crop of rowen. Late potatoes look well; some blight and rot. Apples, pears, peaches and grapes are light crops; cranberries fair. Pastures are in fair condition for the time of year. Oats and barley are normal crops.

Millis (E. F. RICHARDSON.) — Field corn is extra good, this being a fine corn season. Sweet corn is not grown for canning. There will be more than an average crop of rowen. Late potatoes promise well, with neither blight nor rot as yet. Pears will give a good yield; other fruits light. Pasturage is in fair condition. Oats and barley have been average crops.

Franklin (C. M. ALLEN). — Indian corn looks finely. Sweet corn is not raised for canning in this section. Rowen looks very well, but is late and will be light. The prospect for late potatoes is poor, though there is neither blight nor rot as yet. Apples very light; pears good; peaches fine; grapes medium. Pastures are in very good condition. Oats and barley were very good crops. The season has been a good one, except that the hay crop was nearly a fourth short.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Indian corn generally has made good growth; but, owing to dry weather, is earing poorly on high ground. Sweet corn is not raised for canning. Rowen is fairly

good on low land ; little or none on high. The prospect for late potatoes is generally good, with no blight. Apples poor ; pears generally good ; grapes good ; cranberries uncertain. Pasturage fair on low land, poor on high. What little oats and barley there are are grown compared favorably with good years. Generally speaking, the weather has been too dry in this section the last two months.

Norton (WILLIAM A. LANE). — Field corn is in very good condition. Sweet corn is not raised for canning. Rowen is about an average crop. Some late potatoes have blighted. There will be a light crop of all fruits. Pasturage is in fair condition. There is a heavy crop of oats. Crops in general are looking well.

Attleborough (ISAAC ALGER). — Indian corn is above the average. Sweet corn is grown for market, but not for canning. Rowen will be less than an average crop. The potato crop is extremely small, not half as many as last year. All fruits show small crops. Pastures are in fair condition. Oats and barley are average crops. The hot dry weather in July was too much for potatoes.

Seekonk (JOHN W. REED). — Indian corn looks well. Sweet corn is little raised for canning, mostly for market. Rowen will not give as good a crop as usual, owing to dry weather after first cutting. Late potatoes are fairly good, though some fields show rot and the vines are dying down. Apples scarce ; pears and peaches plentiful ; grapes and cranberries fair. Pasturage is fully up to the average in condition. Oats and barley are good crops generally.

Dighton (JAMES N. PAUL). — Field corn is in good condition. Sweet corn is not raised for canning, but quite a large acreage is raised for market, and is looking well. The prospect for rowen is good. Not many late potatoes raised ; have blighted some, but show no rot as yet. Apples good ; pears poor ; no peaches ; not many grapes ; cranberries not grown. Pastures are in good condition. Oats and barley are not grown. Strawberry plants set this season are looking well, and also most of the old beds that were cleaned out for another year. There is a large acreage of tomatoes for canning and the market, and they have made a large growth of vine, but do not promise much fruit.

Swansea (F. G. ARNOLD). — Indian corn is in very good condition. Sweet corn is not used for canning, being all sold in nearby markets. Rowen will be fully an average crop. Late potatoes look well where sprayed ; no rot reported. Apples poor ; pears poor ; peaches very good ; grapes good. Pastures are in very good condition. Oats and barley are cut green for fodder ; where raised for grain this year they were damaged by the army worm.

Dartmouth (L. T. DAVIS). — Field corn has made a fine growth, and I think is earing well. Sweet corn is not raised for market. Rowen is much below the average. Late potatoes are not much raised, but there is neither blight nor rot, and a normal crop is promised. Pasturage is getting somewhat short, but is quite fair for the season. Oats and barley have made fair, normal yields.

PLYMOUTH COUNTY.

Norwell (H. A. TURNER). — Indian corn is in very good condition. Sweet corn is not raised for canning in this locality. There will hardly be a normal crop of rowen. Have noticed no blight or rot on late potatoes. Apples and pears are looking well, also cranberries. Pasturage is in very good condition. Not many oats and very little barley raised in this locality.

Hanover. — (HARRISON L. HOUSE). — Field corn is in fair condition. Sweet corn is not raised for canning. There will be a normal crop of rowen. Late potatoes promise well, with neither blight nor rot as yet. Apples and pears good; no peaches; few grapes; cranberries good. Pasturage is in normal condition. Oats are fully up to the average; no barley raised.

West Bridgewater (C. P. HOWARD). — Corn is looking the best that it has for several years. Sweet corn is not grown for canning. It has been so dry that nothing but clover makes any show as rowen. Owing to the dry season, the yield of potatoes is light; no blight as yet. Only a few apples; no peach trees survived the winter, and many grape vines were killed. There has not been rain enough to provide good feed in the pastures. Oats and barley looked well, but were all cut green and cured for hay.

Hanson (FLAVAL S. THOMAS, M.D.). — Indian corn is in good condition. Sweet corn is not raised for canning. The prospect for rowen is poor. There will be a good yield of late potatoes, although there is some blight and rot. Apples, pears and peaches small, poor and few; grapes and cranberries fair. Pastures are in good condition. Oats and barley are about the same as usual. For three nights we have just escaped frost.

Plympton (WINTHROP FILLEBROWN). — Where Indian corn came up well it is now in the best condition it has been for several years. Sweet corn is not grown for canning. Rowen is better than usual. Some of the late potatoes are still clean and bright, and there is no indication of rot. Apples are not up to the usual crop; pears, peaches and grapes about normal; some cranberry bogs are showing an exceptional crop. Pasturage is in exceptionally good condition. Oats and barley are not raised for grain.

Halifax (G. W. HAYWARD). — Corn has gained rapidly the last month, and we shall have a full crop. Sweet corn is not raised for market. On low ground rowen looks well, but on the whole the crop will be light. Apples light; pears few; no peaches; some grapes; cranberries fair. Pasturage is now rather short. Oats and barley are full average crops.

Wareham (A. B. SAVARY). — Field corn is in good condition. Sweet corn is not raised for canning. There will be a normal crop of rowen. There is a fair prospect for late potatoes, but some blight has appeared. There will be a few apples; cranberries below average. Pastures are in good condition. Oats and barley are about the usual yields.

Mattapoisett (E. C. STETSON). — Indian corn is in very good condition. There is no canning of sweet corn in this locality. Rowen promises a very good crop. There is a good prospect for late potatoes, but there is a little blight and rot. There will be few apples; pears good; very few peaches; grapes and cranberries good. Pasturage is in good condition. Oats and barley are a little better crops than usual.

BARNSTABLE COUNTY.

Bourne (DAVID D. NYE). — Indian corn is in very good condition. Sweet corn is only raised for home consumption and forage. Rowen is looking finely, with the promise of a good crop. The potato crop is maturing well; no late ones planted. Apples scarce; some pears; very few peaches; some grapes; cranberries one-third crop. Pastures are looking exceedingly well. Oats are and have been up to former years; no barley raised. Garden crops of all kinds are looking very well.

Mashpee (W. F. HAMMOND). — The crop of field corn will be about average. Sweet corn is not raised for canning. The rowen crop will be above the average. There is prospect of a good crop of late potatoes. There will be half the usual crop of apples, pears, grapes and cranberries. Pasturage is above the average in condition. Oats average crop; barley not raised.

Barnstable (JOHN BURSLEY). — Indian corn is in fair condition. Sweet corn is not grown for canning. There will be a full crop of rowen. Late potatoes promise well, with no blight as yet. Apples good; pears very light; peaches light; grapes good; cranberries fair. Pasturage in good condition. Oats very good; no barley grown.

Dennis (JOSHUA CROWELL). — Indian corn is in good condition. Sweet corn is not raised for canning. Late potatoes look well,

and no blight or rot has appeared. Apples fair; very few pears; cranberry crop very light. Pastures rather short. Fruit worms are making sad havoc with cranberries in this vicinity, and the prospect is for a very small crop.

Harwich (AMBROSE N. DOANE). — Field corn is in very good condition. Sweet corn is not raised for canning. Rowen promises to give a fair yield. Late potatoes are looking well, with no rot or blight. Apples, pears and peaches are looking badly; grapes fair; cranberries about 40 per cent of the crop of 1904. Pasturage is poor on uplands and good on lowlands. Oats and barley are very good crops. Our cranberry crop was badly injured by winter-killing, spring frost, vine worms; and now the fruit worm is eating badly, with the result that the crop will be very poor this season.

Truro (D. E. PAINE). — Indian corn is not raised. Sweet corn is not raised for canning. Rowen promises a very fair crop. The prospect for late potatoes is fair. Few apples, pears, peaches and grapes; cranberries fair. Pasturage is in very good condition. Oats and barley are very little raised.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Field corn is above the average in condition. Sweet corn is not raised for canning. Rowen will be above an average crop. There is some complaint of a small yield of late potatoes, but blight and rot have not appeared. There is a fair prospect for fruit of all kinds. Pasturage is in good condition. Oats are above an average crop.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — Indian corn is in normal condition. Sweet corn is not raised for canning. Rowen will be a good crop on low land. The prospect for late potatoes is poor and most fields have blight or rot. There is no fruit here; cranberries a normal crop. Pasturage is in good condition. There will be fair average yields of oats and barley.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

PRACTICAL POULTRY HOUSING.

By JOHN H. ROBINSON, *Editor of "Farm-Poultry," Boston, Mass.*

At several of the farmers' institutes in this State which it has been my privilege to address during the past year, the description of some poultry houses I am using and explanation of reasons for using them has excited enough interest to make me think farmers throughout the State may be equally interested in that subject.

The ideas and principles upon which this method of housing poultry is based are not new, nor are they at all novel. On the contrary, they are very old and very common. The noteworthy thing about them is that they have not until within a few years seemed to those looking for the best ways of housing poultry to be worth serious consideration. For several years now they have been much discussed in the poultry press, and the general interest in them and increasing tendency to use them marks what is probably the last stage in the reaction from the plans and methods most in favor since the interest in better results from poultry culture began to assume its present importance.

For a great many years authorities on poultry keeping have advocated warm, tightly built poultry houses. They have held that, inasmuch as hens naturally laid best during the spring, the essential thing (if one wanted to get eggs in winter) was to reproduce spring conditions, especially temperature. So, with double and triple walls, with dead air spaces, with double sash on the windows, with large windows to admit as much sunlight as possible by day and with roosting rooms and closets to shut the fowls up close and keep them warm in at night, they have tried to approximate spring conditions. In a degree they have succeeded, as far as temperature is concerned, — that is to say they have succeeded in maintaining a higher temperature in the poultry houses than is usually found in out buildings for live stock. They have protected the fowls from the extremes of winter weather.

But the temperature is only a part of spring conditions. In spring and summer fowls have, with the higher temperatures, abundance of air

in the houses, and live much out doors. The out-door temperature and the temperature inside the house are not much different. In the house it is cooler on a very warm day and warmer on a cool day, but the difference would rarely exceed eight or ten degrees either way.

In winter, if the house is to be kept at a much higher temperature compared with the out-door atmosphere than at other seasons, the house must be shut up, and there must be no free and rapid circulation of air between the exterior and interior, except when the out-door temperature is high: for free circulation of air when the outer temperature is low will reduce the temperature in the house to within eight or ten degrees of the outside temperature, and if the outside temperature is zero, or ten, twenty or more degrees below, this makes the inside colder than, on the theory that the house should be kept warm, is advisable.



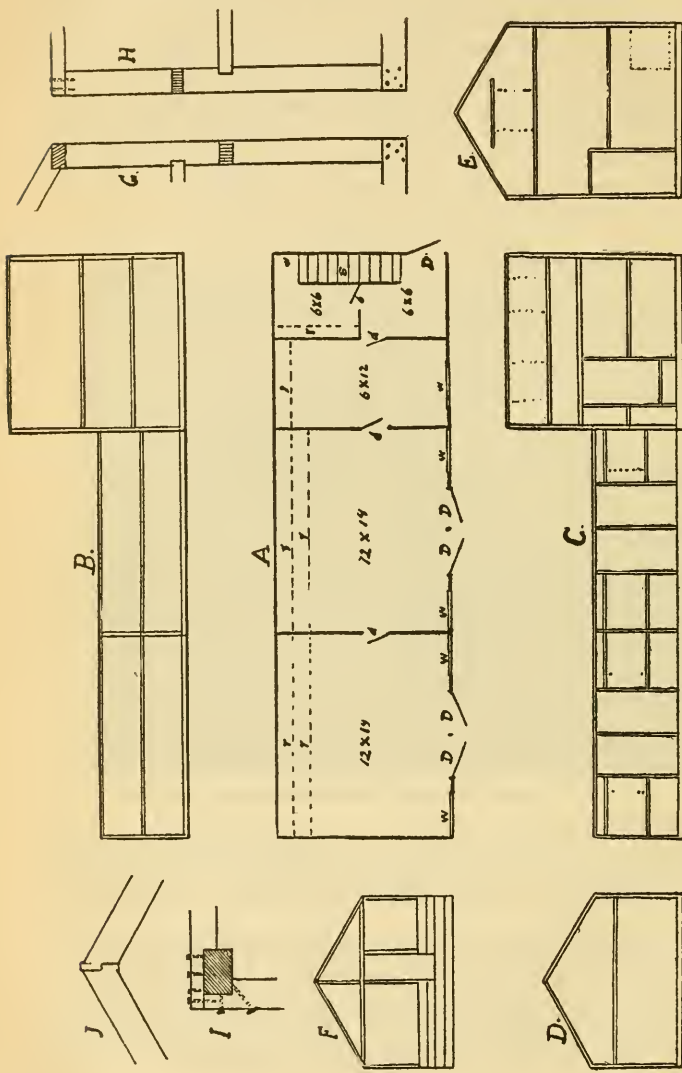
BUILDING USED IN J. H. ROBINSON'S FIRST COLD POULTRY HOUSE EXPERIMENT.

To keep the temperature in the house up as high as required by this theory of housing, the house must either be kept shut so close that the heat from the fowls keeps up the temperature, or must be heated artificially.

Artificial heating in houses for laying stock has been tried many times, but generally discarded as unsatisfactory, and not giving returns to justify the expense. In central New York some of the large egg farmers who use S. C. White Leghorns to produce eggs for the New York city market keep stoves in their houses, but I know of nowhere else where it is generally done.

When a house is kept shut close enough to keep the temperature up by the heat from the fowls, proper ventilation becomes at times impossible. Under some conditions the house cannot be kept warm with the heat from this source, and at the same time the air in it renewed as often as it should be. When only the nights are cold, or occasionally

there is a day so cool that it is thought best to keep the house shut up, no serious bad results develop. But when there are several days of continued cold weather, with the houses shut all the time, conditions inside the houses begin to be bad; and if — as sometimes happens — cold and



PLAN OF POULTRY HOUSE USED IN J. H. ROBINSON'S FIRST COLD HOUSE EXPERIMENT. — This building consists of two parts, — a two-pen house 12 feet wide by 28 feet long, and a two-story part 12 feet square, with small pens on ground floor and room for pigeons, storage or other special use overhead. The low part is 6 feet high at the eaves, the other 12 feet. A, ground plan of house; D1, outside doors; dd, inside doors; ww, windows; rr, roots; s, stair; B, outline of frame work of rear wall; C, outline of frame of front wall; the dotted lines indicate the position of the windows; D, outline of frame of west end; E, outline of frame of east end; F, an inside partition between pens; G, framing of west end at corner post; H, framing of back at corner post; I, framing of posts and sills at corner; J, method of roof construction at peak, explained in the text.

stormy weather is prolonged for a week or more, conditions in the poultry house become very bad, the walls and under side of the roof drip with moisture, and the air becomes bad. Under such conditions roup often develops and becomes epidemic; or, where no virulent disease appears, the fowls are catarrhal, debilitated and unproductive.

It is often said that roup and kindred diseases were rare in old times, when most of the stock in the country was mongrel or old barnyard stock, and when all the attention the average poultryman gave to selection for breeding was to swap roosters every year; and many attribute the trouble to in-breeding, and to a greater liability to disease in thoroughbred fowls. I think it is due more to other causes, and as much to tight, badly-ventilated houses as to any other cause, or perhaps to all other causes combined. Certain it is that in a great many instances in the last few years opening up the poultry houses and giving the fowls pure air in abundance by night as well as by day has been followed by a marked improvement in the general health of the flock.

My own experimenting with cold and open houses was undertaken to show what was possible under conditions quite the opposite of those generally recommended as necessary to good egg production and healthy stock in winter. I was constantly receiving inquiries from poultrymen having trouble with damp houses as to how to remedy that condition; and, as I visited poultry plants in winter, I almost always found the houses damp, badly ventilated, and overheated about midday even of quite cold days.

I think that in most cases conditions need not have been bad had the poultrymen used ordinary judgment in opening doors and windows. The common practice was to keep houses closed in winter except on very bright, warm days, and then open them either only for a little while in the middle of the day, or open them toward midday and leave them open until dark. Very often it would happen that houses were kept closed tight all day on a bright day, when the sun shone warm during the middle of the day and made the poultry house as warm as a green-house. Frequently the poultryman kept doors and windows shut nearly all the time, relying upon his ventilators to supply fresh air. That the ventilation did not work as theoretically as it was supposed to work was generally plain to any one who stepped into the house, — except the owner. Where the intention was to ventilate by means of doors and windows, opening the house up gradually in the morning and gradually closing it in the afternoon, the system rarely operated as planned. Such a plan, if faithfully put in practice, works well except for long-continued cold weather, when the short time the house may be opened is not long enough to thoroughly air and dry it; but I have seen very few plants on which this plan of ventilation was operated as it should be. On most plants it is attended to very irregularly, and often neglected for days while the poultryman's time is taken up with matters which seem of more pressing importance. Such a system of ventilating requires more time and attention than many poultrymen are able to give it; hence, is not for them a satisfactory system.

There was no guess-work or theory about my opinion that most poultry keepers would not give the ventilation of tight houses the attention necessary to make them satisfactory. Almost everywhere I went in winter I saw it, and found also that the worse conditions became in tight houses, the more afraid were the owners to let the air into them.

Various ways of preventing dampness in a tight house have been

devised. Thick walls, double or triple, with air spaces or linings between, will not frost inside in cold weather as the single walls do. Some poultrymen make a loft of the space under the roof above the plates, and fill or partly fill it with hay or straw, which will absorb the moisture and keep the room dry.

Such devices, however, do not solve the problem of fresh air. It is practically impossible to keep a poultry house shut up so that the heat from the hens will keep it warm, and at the same time have the air in it renewed as it should be. If the building is large in proportion to the number of fowls kept in it, the heat from them has no appreciable effect on the temperature of it. If it is small enough to be kept warm by as many fowls as its floor space will accommodate, the air in it soon becomes vitiated. As I had occasion to look at the subjects of warmth and ventilation in the light of the experience of many different people, I began to think perhaps the prevailing ideas on those matters were not correct, and to ask myself whether it were not possible to get better conditions and satisfactory results in houses of a different kind.

To this question I found an answer that satisfied me in the large number of instances I could collect from memory, where as good results had been obtained in cold, poorly built houses as the average results in warm houses, and in the few instances where exceptionally good results had been obtained under conditions that we had been accustomed to regard as very bad. Such occurrences had, of course, been considered in the forming of the general authoritative opinion as to the requirements of winter poultry keeping, but were usually considered as exceptions that proved the rule, — a very convenient way of getting around facts that do not accord with theories.

But, however convincing the evidence a man may gather in this way may be to himself, it has not much weight with others; so, instead of publishing the results of my thoughts, I went to work, built a house that in several important features was quite contrary to prevailing ideas of what a poultry house should be, and used it for nearly a year before saying anything publicly about it.

This house was a mere shell or shed; the walls were of common hemlock boards, laid perpendicularly on a light frame, and the joints between the boards covered on the back and ends of the house with common battens; the joints on the front were left open. The roof was of shingles, laid on strips of furring placed three inches apart.

The house was not tight anywhere. As I used it the first winter, — it having been built in a hurry late in the fall, — the battens were merely held in place with two or three small nails in each, and were loose enough to let a great deal of air in around them. The cracks in the boards, some quite large, were not covered at all. The front of the house had double doors six feet wide in each section, and these were kept open all day unless a storm would beat in, and all night except on very coldest nights or nights when storms would drive into the doors.

The house was built on wet ground, — that is, ground that was thoroughly soaked by the late rains. After the roof was on, the ground in the house was spaded up; and when the house, a few days later, was

ready to put the fowls in, the surface of the ground in it was dry, but a mere scratching of it would show damp earth. By spring there was about two inches of dry earth on top, and the soil damp below that. The walls in the house were dry, — never a bit of moisture on them except as a driving rain might wet through the joints and cracks. This would dry out quickly, and I never noticed any ill effects from it.

The house was cold, — the temperature in it was but little higher at any time than that out doors; yet going into it I noticed that it always felt comfortable, with a feeling like what you get in a warm, sheltered spot out doors, — not at all like the warmth of a heated building.

The hens always seemed as comfortable in it as I ever saw hens anywhere. There were some fifty to sixty in it that winter, and only two slight cases of colds, which recovered immediately with no treatment



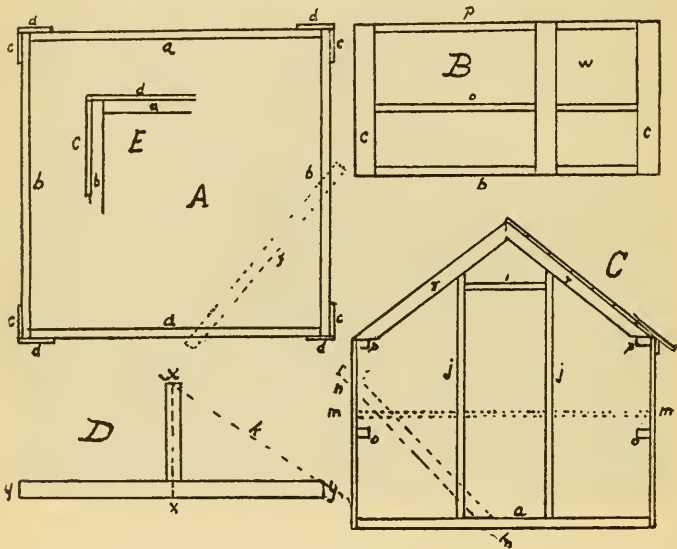
HOUSE IN WHICH LIGHT BRAHMA PULLETS WERE KEPT.

but a single application of vaseline to the head. The egg yield was fair, comparing favorably with average good reports. The hens in this house were Light Brahmas. I published a report of experience with this house, and on the strength of my experience with it began to urge correspondents who had much trouble with damp houses or unhealthy fowls to open up their houses, and keep them open at all seasons.

The next year I continued to use this house the same way, but put in a part of it a pen of Silver Dorkings, a breed reputed to be rather delicate and susceptible to cold, and having combs which would be more quickly affected by the frost. I also built another smaller house, on the same principle, and put in it a brood of late-hatched Brahma chickens. The Dorking male had his comb very badly frozen, but the hens' combs were scarcely nipped at all. They were put into the house December 1, began to lay in about three weeks, and laid well all winter.

The brood of chickens hatched June 27 that I put in the small house

in October made a remarkable record for growth and early maturity. I got the first egg January 15, and by February 1 all the pullets, nine in number, were laying; and from that time until February 22, when I took some out to put in my breeding pen, the nine pullets were giving me about a fifty per cent egg yield, and still growing. I weighed them all on February 22, and found five of the nine weighing nine and one-half pounds or over, and none of the others much below it. These pullets were not fat; they were big pullets, in good condition. Their house, as shown in one of the illustrations accompanying this article, was battened only on the back and half way forward on each side. The door was open practically all the time, day and night; and the windows were always partly open except when a storm came against one, when that one would be closed.



DETAILS OF CONSTRUCTION OF HOUSE SHOWN ON P. 33.—This house is 8 feet square on the ground, 4 feet high at sides, 7 feet in the middle. Cost about \$12. A, sill plan, with position of corner boards indicated at c c c c, d d d d; E, construction of a corner; B, side; C, front; D, method of cutting pattern for rafters.

The next winter, still continuing to use the houses I had already built, I built on frozen ground late in November a house very similar to that in which the Brahma pullets just mentioned had been kept. It was made of old material, and was a little poorer in construction all around than the other house, joints between sides and roof not as good, and some very wide joints between boards in front. Into this house I put my Dorking hens and pullets. This winter, 1903-4, was, as all know, a record-breaker for cold and snow. Frequently after a night of driving storm I would go to this house and find so much snow sifted through the joints at the back that there was a light sprinkle of it all over the litter on the floor,—so much that the hens would not come down from the roost until the litter had been shaken up; and the backs of the hens

as they sat on the roosts were well coated with snow. The tips of the hens' combs were somewhat frosted (no male was put in the house), but these hens gave me about a forty per cent egg yield in January, 1904. There were very few hens in any kind of house anywhere doing better at that time.

During the several winters covered by the experiments mentioned my fowls were cared for by myself when at home, at other times by different members of the household, none of whom had any particular interest in or skill in feeding fowls. Our one rule for feeding was to be sure that the hens had an abundance. In the first half of the winter I had to be away so much that I found it impossible to keep accurate egg records. When I relied on others, they forgot; and so I gave up thought of making statistical figures complete, concluding that circumstances limited me to general demonstrations of a few leading facts, and the exact results possible in cold houses and comparison of these with results in other houses would have to be left to others. My trials demonstrated that hens could be kept healthy and giving average good egg yields in cold, open houses. So far as I could judge, they consumed no more food than when kept in warm houses, though theoretically it should have required more.

Last winter the only item of experience in my poultry yard having a further bearing on this subject was the performance of a pen of July-hatched Single-combed White Orpingtons. These were put in an old poultry house that was sheathed, papered and covered with common lapped siding on the sides and with shingles on the roof. The front of this house was about half glass, an immovable window, and there was a half-window in each end, the door being at the north-west corner. The growth of an apple tree near the house had forced a board from the front next the roof, and there was an opening here the length of the house wide enough "to throw a cat through." The west window was wide open all winter. The pullets in this house had been sold early in January, and, as I was expecting to ship them any day, we kept no record of their laying. The buyer failed to take them; but, as I still intended to let them go, and as some weeks had passed with no records kept, we let them go along unrecorded. Through January, February and March these pullets, nine in number, laid rarely less than seven eggs a day, and often nine for several days in succession. Nearly all their combs were somewhat frosted, and the comb of the male at one time quite badly frosted.

Now, of what use was it to demonstrate that warm houses are not essential to egg production, and that hens can be kept healthy and productive in very cold houses?

I went to the extreme, giving my fowls houses that were mere shelters, to show more convincingly, by extreme illustrations, that warm houses, which are more expensive to construct and require more careful attention to operate, were not absolutely essential. My tests, though not furnishing statistics, do show conclusively that egg production is not necessarily dependent upon "spring" conditions; and that the cold, open house for poultry is the style of house in which the labor of earing

for them can be reduced to the minimum. Considered in connection with the general difficulties with tight buildings, they indicate also that the safest and most profitable and practical type of house for most poultry keepers is the house that is so constructed that it does not require close attention from the poultry keeper to keep conditions in it safe. They have not developed what is the best construction of house. It is reasonable to assume that a little better construction than I have used would be better,— would afford more protection, without making conditions that interfere with the steady renewal, in abundance, of supplies of fresh air.

Between the house so tightly built that the ventilation in it is very bad, and one so open that the temperature in it is but slightly higher than out doors in extremest cold weather, there is a medium form of construction and an intermediate in methods of operation, which will give more protection in the house without reducing too much the circulation of air in it. I think this medium form of construction must be much nearer the cold than the warm plan of housing; for when air is admitted freely, as it should be, the house cannot be kept very warm; and when the house cannot be kept warm, it is superfluous to make walls thick, and adds unnecessarily to the cost of construction. A wall of inch boards covered with a good building paper is as tight as if it were a foot thick. If a house is built with tight back, ends and roof, and has wide doors and good-sized windows in front, and doors and windows are kept open as much as is necessary to prevent moisture from collecting on the walls and lower side of roof, the air will be good in that house, and the fowls healthy as far as health depends on good air. In a cold climate, such a house will be cold,— not as cold as outside, but still a cold house.

The special interest farmers have in this plan of housing fowls is in the demonstration it makes of the fact that there may be good egg production in a cold house; and that one need not despair of getting eggs in winter because his poultry houses are cold, or think that when he fails to get eggs in winter it is because his houses are cold. On most farms at present the poultry houses are of the class of those I use; and I find a great many farmers have been under the impression that it was useless to put forth special efforts to get winter eggs from poultry in such houses. The fact is that the house is not a matter of prime importance, except that in a warm, tight house that is kept shut up too much the hens are more likely to go out of condition and fail to lay than in a cold house; and, again, hens that do lay well in a warm house are apt to become debilitated and weak, and unfit for future usefulness either as layers or breeders.

The thing of first importance in the production of winter eggs is to have the fowls ready to lay about the beginning of winter; after that, the point of greatest importance is to feed well. These are the things without which you cannot get eggs until they are full grown. Old hens do not lay profitably until they have molted. Both pullets and hens in laying condition must have food enough to maintain themselves, and enough more to convert into eggs. In the spring a hen may produce

eggs at the expense of her maintenance, but in fall and early winter she will not, as a rule.

The principle which the possibility of good results in cold houses and the successes and difficulties with hens in warm houses combine to establish is this: given hens in laying condition, and abundance of proper food, egg production depends on uniformity of conditions more than on high temperature.

Such uniformity of conditions is more easily secured in a house that is not much different in temperature from the outside air than in one that is kept much warmer than the outer air in extreme cold weather. In the open house the variations of temperature are less than in the house that is kept warm in coldest weather, unless the ventilation of the warm house is looked after much more closely than is customary. The open house does not need close attention. The fowls in it are hardened,—accustomed to a lower range of temperatures than those in warm houses. Because of this, and because, breathing always pure air, their vitality and capacity to stand changes in the weather are greater, they are less affected by weather changes than fowls in closed houses.

To their better circulation and greater vitality also I attribute greater perfection in bodily functions, as seen in the greater fertility of the eggs from such fowls, and in the apparent fact that they get more nutriment from the food they eat. As I said a little while ago, I could never see that the fowls in the cold houses took any more food than fowls in warm houses. Since I began the experiments mentioned in this article a great many have been making observations along the same line, some independently of and without knowledge of what I was doing, and others because of the interest discussion of my tests excited. The general verdict of these is that no more food is consumed in the cold houses. Some say the fowls in the cold houses seem to eat less; a few affirm that they do eat less. Such statements seem at first thought improbable, yet they are not, on consideration, wholly unreasonable.

It is a fact which any one who has the opportunity and cares to take the trouble can easily demonstrate for himself, that dwarfed and stunted chickens eat as much as well-growing, hearty chickens of the same lots, yet hardly show any increase in size, while the others are growing rapidly. Long after the thrifty chickens have grown out of all comparison with the runts, if you separate them you may find the little runts eating much more in proportion to their size and rate of growth than the others, and often eating actually as much as the others. Why is it? Simply because digestion and assimilation are imperfect. The chick is ill nourished, not because it does not get enough or the proper variety of food, but because its system does not do its work properly. Much of its food passes through it undigested. So with the fowl which breathes impure air. Its functions are sluggish. Its circulation is poor, as often shown in the chilled comb and the general air of listlessness. It is reasonable to suppose that digestion, too, is impaired, and the fowl gets less nourishment from a given quantity of food than it would if all functions of the body were in a higher state of activity. From this point of view, the observation that hens eat no more, and may eat less, in cold

houses, seems worthy of some credit ; and it begins to be doubtful whether there is actually, as theoretically there has been, an economy of food in using warm houses.

The strongest point that can be brought against the cold house for poultry is that it is not suitable for fowls with large combs and wattles easily affected by frost. This point has not so much weight with farmers in this State as in places where Leghorn and Minorca fowls are kept, because white eggs are wanted. Here most of the fowls on the farms are Plymouth Rocks, Wyandottes or Rhode Island Reds. The combs of the hens of these breeds are not easily affected by frost. Many of the male birds are almost as easily frosted as Leghorns. Where only a few males are needed they can be removed to warmer quarters on very cold nights ; but with birds not intended for exhibition, or for sale for purposes where a frosted comb would count against them, I would let the comb freeze and the bird lose a part of it. It seems a cruel way, yet on the whole is more merciful ; for, if the bird is properly taken care of after the comb is frosted, it does not seem to suffer much, the comb soon heals, the frosted tips drop off, and the bird is thereafter practically immune from frost bite, and the keeper does not have to give it special care.

I make the foregoing suggestion to those who have male birds with moderately large combs, and want to use cold houses. I would not advise it for fowls with very large combs, which if exposed would lose most of the comb. The best way is to keep fowls with small combs not easily frosted, or if one thinks he must have large-combed fowls, to select for breeders those least susceptible to frost. There is a great difference in individual birds in this respect. I have had Leghorn males with very large combs that were never frosted, though repeatedly exposed to temperatures at which other Leghorn males and many males with smaller combs were quite badly frostbitten. A few people using cold houses for Leghorns report that their Leghorns that have been all their lives kept in such houses do not suffer as much from frosted combs as the same stock in closed houses. While I would not deny that they may be correct, it seems to me that conditions with them must be more moderate than in this section, or the houses were not as open as those I have been describing. As a matter of fact, large-combed males are a deal of trouble where the winters are cold, no matter what kind of a house is used ; and practical poultry keepers, whether on farms or elsewhere, will find it to their advantage to breed for small combs. There is, I know, a very general belief that the largest-combed hens are the best layers and the largest-combed males the most vigorous sexually, and hence the most useful as breeders ; but I think this impression erroneous. The best-laying Barred Rocks I ever owned had combs so small that the development of the comb as the pullets began to lay was often not noticeable. In Leghorns I have never found the size of the comb at all reliable as an index of laying capacity ; my good layers of that breed have had large, medium and small combs, and I have found all degrees of productiveness in all kinds of comb but one. There is a type of comb most conspicuous in Leghorns and other large-combed fowls, but

found in all classes of fowls but those having very small combs, that I believe is a sure index of lack of vitality. This is the undeveloped comb that goes with a peaked-looking head on a poorly developed bird. It is small to medium in size, and shrivelled in appearance. The small comb that still appears to be fully developed is the ideal comb for the fowls of the practical poultryman; and if he breeds for such combs on his fowls and for general hardiness, he will soon have stock of which both males and females are adapted to the cold house in practice.

I have gone thus at length into this matter of size of comb, because the fact that in a cold house in this climate the temperature will go lower than is safe for most large-combed males is the one serious objection to cold houses. The other objections cannot be maintained against a test, but the cold house is not a house for a male with an easily-frosted comb.

The characteristic feature of the cold, thoroughly ventilated poultry house is not so much in the method of construction as in operation. By opening doors and windows, any house can be made a cold poultry house. A good many houses built for warmth are now being used as cold houses. If the owners had to build over again, they would build less expensively; for there is no need of making special efforts to have a building very warm, when the windows are to be always open.

The cold poultry house may be of almost any design or style desired, except that ventilation should be from the front of the house and the roosts at the rear; for the philosophy of cold housing is not to expose the fowls as much as possible, but to strike the degree of protection which is sufficient for the fowls and least trouble to the keeper.

With this article I give the plans of the houses I have described. These are houses that suit me for flocks of the numbers kept in each, and houses well adapted to farm poultry keeping. The small house, if made with close-fitting joints on the back and half way forward on the sides, is warm enough for the breed I keep, or for hens of the American breeds, Plymouth Rocks, Wyandottes and Rhode Island Reds. The larger house, unless in a very sheltered location, is better to be tight everywhere but in front, for it is a higher house, and the heat from the hens makes less impression in it. In the small house the heat from a dozen large hens has a very perceptible effect on the temperature, even in zero weather.

In conclusion, let me briefly enumerate the advantages of cold houses:—

1. Economy of construction.
2. Economy of time and relief from close attention to ventilation.
3. Healthier fowls.

The foregoing are the positive advantages. As to results, we may say:—

1. That, as a rule, the production of eggs will not be as good as in warm houses that are carefully operated, but will be better than in warm houses as commonly operated.

2. That, whether the difference in egg production in a warm house can be made enough greater to pay for the better attention and the

greater risks of disease as a result of any little slip in the system, is a question for each individual to determine for himself. Most farmers would determine in favor of the cold house, because it leaves them more free to look after other work.

A FINAL CAUTION.

The cold house, though it has advantages, is but a part of a system. I have made the point that the kind of house is not a matter of prime importance; that the essential things in the production of winter eggs were:—

1. To have pullets and hens ready to lay at the beginning of winter.
2. To feed them well.

The argument for the cold house rests on the proposition that uniformity of temperature and dryness in the house are the most favorable conditions for health and egg production, and that these are more surely secured by most people in cold houses than in warm ones.

The cold house is simply a condition for the hens, and a convenience for the poultry keeper.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF SEPTEMBER, 1905.

SWINE GROWING.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1905.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

CROP REPORT FOR THE MONTH OF SEPTEMBER, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Oct. 2, 1905.

Bulletin No. 5, Crop Report for the month of September, is herewith presented. The reader's attention is called to the article at the close of the bulletin, on "Commercial pork making and pig raising in New England," by A. A. Southwick, farm superintendent of the State Insane Asylum at Taunton, Mass. Mr. Southwick is an enthusiastic believer in that much-abused animal, the domestic hog, and has demonstrated by an experience of many years that there is no more profitable branch of farm industry in New England than the production and growing of swine. In this article the suggestions that he has to offer to those engaged in pig raising, or contemplating taking up the business, are put in a terse but comprehensive and attractive manner.

PROGRESS OF THE SEASON.

The monthly report of the Crop Estimating Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for September, 1905) shows the condition of corn on September 1 to have been 89.5, as compared with 89 a month earlier, 84.6 on Sept. 1, 1904, 80.1 at the corresponding date in 1903, and a ten-year average of 81.7.

The average condition of spring wheat when harvested was 87.3, the only comparison possible, as this is the second year spring wheat has been separately reported, being with the condition a month earlier, which was 89.2, and with that in 1904, which was 66.2. The condition in the five principal States was reported as follows: Minnesota, 84; North Dakota, 89; South Dakota, 89; Iowa, 91; and Washington, 91.

The average condition of the oat crop when harvested was 90.3, against 90.8 August 1, 85.6 on Sept. 1, 1904, 75.7

at the corresponding date in 1903, and a ten-year average of 85.8.

The average condition of barley when harvested was 87.8, against 89.5 on August 1, 87.4 on Sept. 1, 1904, 82.1 at the corresponding date in 1903, and a ten-year average of 83.7.

The average condition of rye when harvested was 90.8, against 86.9 reported Sept. 1, 1904, 84.1 on the corresponding date in 1903, and a ten-year average of 85.8.

The average condition of buckwheat on September 1 was 91.8, against 92.6 a month earlier, 91.5 on Sept. 1, 1904, 91 at the corresponding date in 1903, and a ten-year average of 88.

The average condition of flax September 1 was 94.2, as compared with 96.7 a month earlier and 85.8 on Sept. 1, 1904.

The average condition of tobacco on September 1 was 85.1, against 84.1 a month earlier, 83.7 on Sept. 1, 1904, 83.4 at the corresponding date in 1903, and a five-year average of 81.3.

The average condition of potatoes on September 1 was 80.9, against 87.2 a month earlier, 91.6 on Sept. 1, 1904, 84.3 at the corresponding date in 1903, and a ten-year average of 80.2.

The average condition of rice on September 1 was 92.2, against 92.9 a month earlier, 89.7 on Sept. 1, 1904, and 93.6 at the corresponding date in 1903.

Of the thirteen principal clover-seed-producing States, one, namely, Illinois, reports an increased acreage; four, namely, Ohio, Utah, California and Colorado, report no change in acreage; and all other principal States report decreases. In Ohio and Utah conditions are reported the same as their ten-year averages, while in all other principal States conditions are above such averages.

The number of stock hogs now being fattened is 6 per cent less than the number one year ago. Reports as to size and weight indicate a condition of 96.2, as compared with 94.2 one year ago, and a seven-year average of 94.7.

In Massachusetts the average condition of corn September 1 was given as 95; the average condition of oats when har-

vested as 97 ; the average condition of rye when harvested as 95 ; the average condition of buckwheat September 1 as 94 ; the average condition of tobacco as 100 ; the average condition of potatoes as 84 ; the average condition of apples as 55 ; the production of peaches, as compared with a full crop, as 71 ; the average condition of grapes as 81 : the acreage of clover seed, compared with last year, as 90, and its condition as 93 : the number of stock hogs fattening, compared with last year, as 97, and the average condition as to size and weight as 100.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM WEATHER-CROP BULLETINS OF THE UNITED STATES WEATHER BUREAU.]

Week ending September 4. — The week was slightly cooler than usual in northern New England, over the western portion of the upper Lake region and the northern portions of the upper Mississippi and Missouri valleys, on the north Pacific coast, and over the eastern portions of the west Gulf States. The temperature averaged nearly normal in the lower Lake region and in the Ohio and central Mississippi valleys, and the week was warmer than usual in the Middle and South Atlantic States, the lower Missouri valley and the middle and southern Plateau and Rocky Mountain regions. Very heavy rains fell in New England, the Middle Atlantic States, upper Lake region and in portions of the Ohio valley and Tennessee. The greater part of New England and portions of the Middle Atlantic States and upper Lake region received amounts ranging from 2 to more than 4 inches. South Carolina, northern Georgia, the greater part of the central and west Gulf States, the lower Missouri valley and portions of the lower Lake region and Ohio valley received less than the average rainfall.

Week ending September 11. — The week was cooler than usual in central and southern California, the southern Plateau region, the lower Missouri, central Mississippi and Ohio valleys, and over the greater portion of the Middle Atlantic States and over portions of the Carolinas and central Georgia. Nearly normal temperatures prevailed in New England and the northern portion of the Middle Atlantic States and over

the middle Rocky Mountain slope. The week was warmer than usual in the Gulf districts and from the upper Lake region westward to the north Pacific coast. Very heavy rains fell in the lower Missouri and central Mississippi valleys, the greater part of the Ohio valley, central Tennessee, northern Arkansas, Oklahoma and Indian Territories, amounts ranging from 1 to 5 inches occurring over a large part of these districts. A few stations on the immediate south Atlantic, Gulf and southern New England coasts also reported heavy rains. In the Lake region and generally throughout the Atlantic coast and Gulf districts the rainfall was below the average.

Week ending September 18. — The week was cooler than usual in New England and the Middle Atlantic States, and there was a slight deficiency in temperature over the western portion of the middle and southern Plateau regions and the greater part of the Pacific coast districts. Elsewhere the week was warmer than usual, the temperature being decidedly above the normal from northern Texas to southern Minnesota, the average daily excess ranging from 6° to 10° , and in the Lake region and lower Ohio valley from 3° to 5° . The rainfall was exceptionally heavy in the Missouri valley, amounts ranging from 4 to 8 inches being reported, and considerably more than the average fell in the lower Lake region and generally throughout New England and the northern portion of the Middle Atlantic States. As a whole, the precipitation in the southern States was much below the average, and there was also less than the average precipitation in northern Illinois and over the northern portion of the upper Lake region.

Week ending September 25. — The temperature averaged above the normal over nearly the whole of the United States, being below normal over only a comparatively smaller area in north-western Texas. It is seldom that for a period of seven consecutive days the temperature averages above the normal over so large a proportion of the country. The average daily excess amounted to over 3° over more than half the country, and ranged from 6° to 13° over an area extending from the upper Missouri valley nearly to the north Pacific coast. Heavy rains fell in portions of the lower

Missouri and upper Mississippi valleys, and over limited areas in Louisiana, Texas and Arkansas. There was more than the average in northern New England, portions of the Ohio valley, local areas on the middle and south Atlantic coasts, in southern Florida, portions of New Mexico, Arizona and southern California and on the extreme north Pacific coast. In most of the districts east of the Mississippi, however, the precipitation was below the average, and a large part of the Lake region, lower Ohio valley and the interior of the Atlantic coast and the east Gulf districts received no appreciable amount.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending September 4. — New England. Boston : Temperature favorable ; rainfall excessive last of week ; corn made rapid growth, damaged somewhat from wind ; small grains mostly harvested ; buckwheat promising ; fall seeding begun ; potatoes good, but some rust and blight ; garden truck doing well ; fruit plentiful, except apples ; tobacco excellent crop.

Week ending September 11. — New England. Boston : Weather favorable ; ample precipitation ; moderate temperatures ; corn made good progress, but still slightly late ; abundant crop of sweet corn being canned ; buckwheat filling well : winter apples poor crop, other fruits plentiful ; late hay crop good ; pastures excellent ; potatoes being dug, good crop ; tobacco mostly cut and hung, fine crop.

Week ending September 18. — New England. Boston : Week favorable for crop development ; temperature rather low ; precipitation ample ; light to killing frosts reported, but no great damage ; corn late, but outlook for fine crop ; good second crop Hungarian hay and millet ; except apples, fruit prospects fair ; apples poor, not enough sunshine for ripening ; considerable potato rot reported ; tobacco mostly cut, too damp for best curing results.

Week ending September 25. — New England. Boston : Weather favorable for maturing crops ; precipitation more than ample ; temperature moderate ; no damaging frosts ; corn matured rapidly, and is generally safe from frosts ;

buckwheat prospects good; rowen and fall feed excellent; garden truck outlook good, except much rotting of potatoes; apples poor, other fruit fair; some rotting of peaches; tobacco seriously damaged from pole sweat and over-ripening in wet fields.

THE WEATHER FOR SEPTEMBER, 1905.

The month opened with overcast, unsettled weather, which was followed on the 3d and 4th by a general downpour of rain. Rain fell continuously for thirty-six to forty hours, at times at an unusual rate, and in nearly all sections the amount of rainfall was remarkably heavy, exceeding in most instances the normal fall for a month. A season of clear to partly cloudy weather obtained from the 5th to the 10th, after which there was a week of cloudiness, rains and fog, although the rainfall during the seven days was light. The remainder of the month was fairly good, with a fair amount of sunshine. The temperatures of the month did not depart greatly from the September averages. As a rule, the day readings were somewhat below seasonal, while the nights were generally warmer than usual, and the results were a monthly mean temperature that was practically normal. Cool spells were general on the 14th and 15th, during which light to killing frosts were reported in interior and northern sections, with freezing weather in some portions of the latter. Another cool wave passed over on the 26th and 27th, when light to killing frosts were noted in all except southeastern sections. The month closed with a few days of normal temperature conditions. The heavy and protracted storm of the 3d and 4th resulted in more or less damage by washing of lands, overflowing of fields, lodging and otherwise damaging grass, corn and some other crops. The cool weather and lack of sunshine were also unfavorable to the maturing, harvesting and securing of crops. Viewing the month as a whole, the weather was very unpleasant for September.

In the circular to correspondents returnable to us September 22 the following questions were asked : —

1. How does the crop of Indian corn compare with a normal crop?
2. Are rowen and fall feed up to the normal?
3. Has the usual amount of fall seeding been done, and what is its present condition?
4. How does the onion crop compare with a normal crop?
5. How do potatoes compare with the normal in yield and quality?
6. What is the prospect for root crops, celery and other late market-garden crops?
7. How have apples, pears, peaches, grapes and cranberries turned out?

Returns were received from 151 correspondents, from which the following summary has been made : —

INDIAN CORN.

Indian corn was somewhat backward all the season, and the dull and rainy weather of the first half of September did not ripen it as rapidly as had been hoped, so that at time of making returns much of the crop was still unsecured. An excellent growth of stover was reported, and a good, though not remarkable, growth of ears. Altogether the crop was fully up to the normal, and in some localities perhaps slightly above. Slight damage to the leaves was reported by the frost of the 14th in some localities, but nothing to affect the crop as a whole to any appreciable degree. With the absence of frost and good weather until the time of going to press, much of the crop must have been secured, and a few days more of favorable weather would put it all practically out of danger.

ROWEN AND FALL FEED.

The rains of the first two weeks of the month improved rowen on later-cut fields, and somewhat injured it by lodging on those where the first crop was early secured. On the whole, the crop was considerably improved, but is not yet up to the normal in any section. Owing to the bad weather, much of the crop still remains unsecured, and where cut after

the third week in August it was much damaged in the field. Feed in pastures remains green as in May, though fed short in many instances. The ground is now full of water, and pastures and mowings cannot suffer materially from drought before winter.

FALL SEEDING.

Owing to the wet weather of the latter part of August and the first weeks of September, which made it impossible to work the ground, much less than the usual amount of fall seeding had been done at the time of making returns. In some sections practically the only seeding was that put in in corn. Wherever it has been possible to seed it was reported in fine condition, a good catch and growing luxuriantly. The soil should now be in excellent condition for such seeding as remains undone, but pressure of other fall work may prevent the usual amount being put down.

ONIONS.

Onions are considerably under a normal crop for the State as a whole, being reported as of small size, doubtless due to the midsummer drought, which affected them at an important period of growth. Maggots also did much damage earlier in the season. Practically no blight is reported. The rains have prevented harvesting in most cases, and there are therefore no reports as to prices received.

POTATOES.

The potato crop appears to have scored something closely approaching a total failure. The yield appears to have been light at any stage, and rot is reported from practically all sections, reports ranging from "some" rot to the practical destruction of the crop. White grubs, which have been unusually plenty, also appear to be doing more damage than common. Quality, barring the rot, appears to be excellent, but the tubers are perhaps somewhat less than average in size. Unsprayed fields have almost universally suffered from rot, and many farmers find themselves facing the prospect of purchasing potatoes for their own use the coming winter.

ROOT CROPS, CELERY, ETC.

Root crops generally promised well at time of making returns, though there were a few reports of blight on turnips. Celery also appears to be doing well in most sections, though not especially forward at time of making returns. Cabbages are reported as not being an especially good crop, but other late market-garden crops generally promise well. The absence of frost enabled many of these crops, which had been somewhat backward during the season, to mature in good condition.

FRUIT.

Apples appear to have deteriorated considerably during the month, and a light crop of poor quality is all that is promised in any section, and in numerous localities there will be practically none gathered. Pears are not more than a fair crop, taken as a whole. Peaches yielded well in all sections, but suffered severely from the continued rains of the first two weeks of the month, rotting on the trees to a considerable extent, and failing to color well and ripen properly where they escaped this. Nevertheless, the crop secured is the largest for a considerable series of years. Prices have ruled low, except for the very earliest harvested. Grapes generally have yielded well where the vines survived the winter, but rot is reported in some sections. Cranberries have been still further reduced by the wet weather, and only a light crop will be secured in the regions of commercial production. Wild cranberries are reported as abundant in some sections, but this cannot materially affect the market.

NOTES OF CORRESPONDENTS.

(Returned to us September 22.)

BERKSHIRE COUNTY.

New Marlborough (E. W. RHOADES). — Corn is ripening well, and is a good crop. The rowen crop is late, but good. The frequent rains have been favorable for fall seeding, and much is being done along this line. There are few onions raised in this locality. Some report potatoes a good crop, others only half a crop, being small and scabby. The prospect for rutabagas, mangolds, etc., is extra good, while cabbages are uneven and poor. There is a good crop of peaches; apples will be a light yield, and not very good in quality.

Monterey (WM. S. BIDWELL). — The corn crop is apparently much larger than usual. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. No onions raised here. Potatoes are a better crop than some years. The prospect is good for root crops, celery and other late market-garden crops. Apples are scarce; cranberries plenty.

Tyringham (E. H. SLATER). — Indian corn compares favorably with a normal crop. Rowen and fall feed are better than usual. No great amount of fall seeding has been done. Very few onions are raised here. Potatoes are rotting badly. A light crop of apples will be harvested.

West Stockbridge (J. S. MOORE). — Indian corn is about a normal crop, much better than last year. Recent rains and warm weather have improved rowen and fall feed very much. The usual amount of fall seeding has been done, and it is now looking well. Onions are not raised hereabouts. Early potatoes did well, but late ones are rotting badly, some pieces not being worth digging. Root crops, celery and other late market-garden crops are not raised to any extent, but those who have them report good crops. Apples and pears are fairly good crops, but not as plenty as last year, and prices better. Much farm work is neglected and left undone because of the difficulty of getting good help.

Richmond (TIMOTHY B. SALMON). — Indian corn is very late in ripening, but most of it is up to the average. Rowen and fall feed are up to the normal. Very little fall seeding has been done.

Onions are not raised. Potatoes are rotting very badly. The prospect for root crops, celery and other late market-garden crops is very good. Apples small, about average in quantity; pears very few; peaches very few; no cranberries.

Washington (E. H. EAMES). — Corn is a better crop than for the last two or three years. Rowen and fall feed are up to the normal. No fall seeding has been done as yet. Onions are not raised in this locality. Potatoes are rotting badly, and some fields will not be dug. Apples are about half a crop; pears very good; peaches, grapes and cranberries not raised.

Peru (F. G. CREAMER). — Indian corn is a fair crop. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done, and it has caught well and looks finely. No onions raised. Potatoes are a large crop, but are rotting badly. Turnips, carrots and beets look well; no celery raised. There is a very poor crop of all kinds of fruit.

Cheshire (L. J. NORTHUP). — Indian corn is two weeks late, but will be about a normal crop. Rowen and fall feed are fully up to the normal. The usual amount of fall seeding has been done, but it is too early to report as to condition. The onion crop is very limited, but good where raised. Potatoes are good in quality, but more than half the crop is rotten. The prospect for root crops is very promising. Apples are less than half a normal yield; pears, peaches and grapes fine crops; cranberries not raised.

Savoy (W. W. BURNETT). — Corn is an average crop, but a little late. Rowen and fall feed are up to the usual average. Very little fall seeding has been done, and it must be put in late this season. Onions are not raised in this locality. Potatoes are scarcely an average yield, but of fair quality. Turnips are the principal root crop raised for market, and they promise well. Fruits of all kinds are somewhat below the average yields.

New Ashford (ELIHU INGRAHAM). — There is an average crop of Indian corn. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are not raised. Potatoes were a good crop, but the rot has struck them hard. Root crops, celery and other late market-garden crops are not grown. Apples are about one-third of a crop.

FRANKLIN COUNTY.

Monroe (D. H. SHERMAN). — Corn is but little raised except for the silo. Rowen is more than a normal crop, and fall feed is good. But very little fall seeding has been done. Onions are not raised. Light yield of potatoes, and quality good, but they

are rotting badly, some fields being hardly worth digging. Turnips promise well; no celery raised. Apples are about one-fourth of a crop; few pears; no peaches or grapes; more cranberries than usual.

Rowe (N. E. ADAMS). — Indian corn is about two weeks late, but is of good size. Rowen and fall feed are more than average crops. The usual amount of fall seeding has been done, and it is in good condition. Potatoes are very uneven, and are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. Apples fair; pears poor; peaches good. Potatoes rot just as badly if dug and in the cellar as if in the field, and are in very bad shape.

Hawley (C. C. FULLER). — Indian corn compares very well with a normal crop. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done, and it is in good condition. Onions are not raised hereabouts. There was a good yield of potatoes, but they are rotting. There is a fair yield of all kinds of fruit.

Shelburne (GEO. E. TAYLOR). — Corn was never better this year, and will soon be safe in silo and stock. There is a good crop of rowen, but no weather to secure; pastures are green like May, but feed short. The usual amount of fall seeding has been done, and it is in good condition. Onions are not raised. Potatoes are uneven, and rotting somewhat. Apples are very scarce and poor; some peaches.

Colrain (A. A. SMITH). — Indian corn is fully up to a normal crop. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are not nearly a normal crop. Potatoes are below the normal in both quantity and quality. The prospect is good for root crops, celery and other late market-garden crops. There will be about average yields of all kinds of fruit.

Gill (F. F. STOUGHTON). — Indian corn is fully an average crop. Rowen and fall feed are up to the normal. Not much fall seeding has been done. Very few onions are raised. Not many potatoes have been dug, and there is much complaint of rot. Apples and grapes are a light yield; other fruits not much raised.

Whately (FRANK DICKINSON). — Corn is good, but a week late. Rowen is short and late; fall feed good. The usual amount of fall seeding has been done, and it is coming on well. Onions are small, both in size and total yield. Yield of potatoes good; some rot, quality otherwise fine. The prospect is good for root crops, celery and other late market-garden crops. Apples are half a crop; peaches good; grapes normal.

Sunderland (GEORGE P. SMITH). — Indian corn is a normal crop. Rowen is much improved, but not much has been secured as yet. The usual amount of fall seeding has been done, and it is in good condition. Onions are below normal in size, but are about an average yield. Potatoes are less than a normal yield, and show some rot. Root crops, celery and other late market-garden crops are not much grown. There will be from one-half to two-thirds of a crop of apples; other fruits not much grown.

Erving (CHAS. F. CLARK). — Indian corn compares favorably with a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are very little raised. There is an average yield of potatoes, but they are rotting more than usual. There will be good yields of root crops, celery and other late market-garden crops. There will be a light crop of fruit.

New Salem (DANIEL BALLARD). — Indian corn is somewhat above the normal. There is a fair crop of rowen, and fall feed is holding out well since the rains. About the usual amount of fall seeding has been done, and it is looking well. Onions are a light crop, but are little raised. Potatoes are a light yield, but of good quality. Root crops, celery and other late market-garden crops are looking well, but are not much raised for market. There will be medium yields of apples, pears and grapes.

HAMPSHIRE COUNTY.

Greenwich (WM. S. DOUGLAS). — Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are a fair crop. Potatoes are not up to the normal in yield and quality. The prospect is good for root crops, celery and other late market-garden crops. There will be short yields of all fruits.

Enfield (D. O. CHICKERING). — Indian corn is fully up to the normal. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are not raised to any extent. Yield and quality of potatoes good, but they are rotting very badly. The prospect for root crops, celery and other late market-garden crops is very good. There are very few apples and grapes; pears and peaches yield very well.

Amherst (WM. P. BROOKS). — Corn is fully normal, but a little late in maturing. Rowen and fall feed are up to the usual average, but there is much rowen yet to be cut, as we have had no weather for curing for about three weeks. Nearly all fall seeding is done

in corn, and it has started unusually well. Onions are quite uneven, but on the average a normal crop. Potato yield moderate, some rot in places, cooking quality good. Root crops, celery and late market-garden crops are of little importance, but so far as grown promise well. Apples are very uneven, on the whole a small crop; pears good; peaches abundant, but small; grapes a full crop, but late in ripening. Warm weather and clear sunshine are much needed for curing tobacco, onions and rowen and ripening corn.

South Hadley (W. F. PERSON). — Indian corn is better than an average crop. Rowen and fall feed are not up to the normal, and the rowen crop is very late. More fall seeding than usual has been done, and it all looks good. Onions are a good crop. Potatoes are about half a crop, but of good quality except that they are rotting badly. All market-garden crops are good; cabbages late and light. Apples are a light crop, of poor quality; pears and also grapes and peaches are good crops, and bring good prices.

Easthampton (WM. C. CLAPP). — Indian corn is fully a normal crop. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done, and it is looking well. Onions are an average crop. Potatoes are a good crop, of good quality, but are rotting some. Celery and root crops are fully up to the average. Very few apples; cranberries not grown here; pears have borne well; no peaches grown.

Northampton (H. C. COMINS). — Corn is above the average, and is being cut. The rowen crop is fairly good; also fall feed. Most of the fall seeding is in corn, and it is looking finely. The onion crop is a full average, but good weather is needed for harvesting. Potatoes are rotting badly, otherwise a good crop of fair quality. Root crops, celery, etc., are looking well, and there will be full average crops. Apples are not over a one-third crop; pears fair; peaches an abundant crop, of good quality; grapes not up to the average. The bad weather is greatly hindering the harvesting of all crops.

Westhampton (H. A. PARSONS). — Indian corn is a full crop. Rowen and fall feed are up to the normal. About the usual amount of fall seeding has been done, and it is in good condition. No onions raised here. Potatoes would have made a good yield, but about half the crop has rotted. The prospect is good for root crops, celery and other late market-garden crops. Apples are half a crop, and not up to the usual quality; peaches, pears and grapes good.

Huntington (H. W. STICKNEY). — Indian corn has made a large growth, but is rather backward. The rowen crop is large, but the

weather has not been good for securing it. Not much fall seeding has been done. Potatoes made a large yield, but are rotting badly. Root crops are looking finely. There will be rather small yields of fruit of all kinds.

Goshen (ALVAN BARRUS). — Corn shows a heavy growth, but is late in maturing. Rowen and fall feed are better than normal. Wet weather has hindered fall seeding, but that put in is in fine condition. Onions are a fair crop. Those potatoes maturing before the blight were of light yield, but first quality; late ones better yield, but showing more or less decay. The prospect for root crops and late market-garden crops is about normal. Fruits of all kinds are below par in yield and quality. Springs and streams are well filled.

Cummington (S. W. CLARK). — Indian corn is somewhat above the average, but rather late. Rowen and fall feed are up to the normal, but the weather has been bad for curing rowen. The usual amount of fall seeding has been done, and it is in very good condition. Onions are not raised here. Potatoes are fully up to if not above the normal in yield and quality. The prospect for root crops, celery and other late market-garden crops is very good. Apples are a half crop; other fruit normal. Have had much wet weather; only eight days of sunshine thus far this month.

HAMPDEN COUNTY.

Tolland (EUGENE M. MOORE). — Indian corn is not quite an average crop. Rowen and fall feed were above the normal. The usual amount of fall seeding has been done, and it is in good condition. But few onions are raised, but they are of fair quality. Potatoes are about a normal yield and of good quality, but are rotting badly on some fields. No market-gardening is done here. Apples are about half a crop; very few pears; wild cranberries quite plentiful.

Russell (E. D. PARKS). — The corn crop is up to the average. Rowen is a normal crop on good land, and fall feed is about up to the average. Fall seeding is in very good condition. Onions are little raised. Potatoes are not a very good crop, and are rotting somewhat. There are quite a few apples, pears and peaches. The fall rains have improved pastures and left the ground in better condition.

Westfield (C. F. FOWLER). — The corn crop is the best in years; 10 per cent above the normal. Rowen is a little below the average, but fall feed is good. The usual amount of fall seeding has been done, and it is in fine condition. Potatoes are below the

average both in yield and quality. Mangolds are fine, and other root crops a full average. Apples below average; pears below average; peaches good; grapes a fine yield, but rotting somewhat.

Southwick (L. A. FOWLER). — Rowen and fall feed are above the normal. The usual amount of fall seeding has been done, and it is in good condition. In most localities potatoes are below the normal, and reported to be rotting. The prospect for root crops, celery and other late market-garden crops is good. Peaches and pears turned out fairly well, but apples will be a short crop.

West Springfield (N. T. SMITH). — Indian corn will be above an average crop if frost holds off until it is fully ripe. Rowen has improved rapidly since the rains, but is much below the normal; fall feed is above the normal in condition. About the usual amount of fall seeding has been done, and it is in first-class condition. Onions are below the normal, being small in size. Yield of potatoes not over 60 per cent of the normal, but cooking quality generally fine. Root crops, celery and late market-garden crops are fully up to the average; mangolds especially good; turnips growing rapidly, with prospect of being free from worms. Apples are a short crop; pears below average; peaches fine; grapes fair, but not well filled out.

Chicopee (R. W. BEMIS). — Corn stover looks good, but it is too early to say how it will turn out. Rowen and fall feed are fully up to the normal. I have not seen much fall seeding. Potatoes are about a normal crop in yield and quality. Root crops, celery and other late market-garden crops promise to be fully up to the usual average. All crops are rather small this year, though rowen is heavier than usual.

Wilbraham (H. M. BLISS). — Indian corn is a very good crop. Rowen is below the normal, about three-fourths of a crop. Fall seeding is looking well, and the usual amount has been done. Onions are nearly a normal crop. Potatoes are rotting and the yield is light; about two-thirds of a crop. The prospect for root crops, celery and other late market-garden crops is fairly good. Apples are half a crop; pears 80 per cent; peaches 90 per cent; grapes 100; cranberries 65.

Hampden (JOHN N. ISHAM). — Frosts have held off so that corn has ripened a large crop. The drought in midsummer checked the growth of potatoes, but they will yield a fair crop of good quality. Rowen light; fall feed a good average. The usual amount of fall seeding has been done; it has a good start, and is growing satisfactorily. Onions are about two-thirds of a normal crop, but are small in size. Root crops, cabbages, etc., are making a good growth. Apples light; pears good; peaches extra good.

Palmer (O. P. ALLEN). — Corn is late in earing, and is a little less than a normal crop. Late rains have redeemed the rowen crop from failure. About the usual amount of fall seeding has been done, and it is looking well. Onions are not much raised. Potatoes are a light crop, and are rotting badly. Root crops, celery and other late market-garden crops promise well. Apples are turning out poorly and are of poor quality; peaches and grapes have yielded well, but are rotting on account of excessive rains.

Brimfield (C. S. TARBELL). — Indian corn is better than an average crop. The rowen crop is very late and rather light; fall feed good. About the usual amount of fall seeding has been done, and it is in good condition. Potatoes made a light yield, and are rotting badly. The prospect is very good for root crops, celery and other late market-garden crops. Apples are a very light crop; cranberries good.

WORCESTER COUNTY.

Warren (W. E. PATRICK). — Indian corn is nearly a normal crop, but is late in ripening. Rowen is a light crop, and fall feed is above the normal. The weather has been too rainy for seeding, and little has been done. There is a very light crop of potatoes, and considerable rot. The prospect is good for root crops, celery and other late market-garden crops. There will be very few apples; a good crop of pears and peaches.

Brookfield (FRANK E. PROUTY). — Indian corn is a good crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. But few onions are raised, but those raised are good. Yield of potatoes not up to the normal, and rotting badly. The prospect for root crops, celery and other late market-garden crops is good. Apples are not over a one-third crop; pears good; peaches but little raised and quite good; grapes good; cranberries but little raised.

West Brookfield (MYRON A. RICHARDSON). — Indian corn is the best it has been for years, but a little backward. Rowen and fall feed are not up to the usual average, many fields of rowen not being heavy enough to pay for cutting. No fall seeding has been done as yet, except that done in corn at the last hoeing. Potatoes are rotting somewhat, but are a large yield of excellent quality. Pears and apples below the average, and small in size. Considerable millet has been harvested to help out the hay crop. Ensilage corn is of excellent growth and quality, and is being put into the silos as fast as possible.

New Braintree (CHAS. D. SAGE). — Indian corn is fully up to the average. Fall feed was never better, rowen nearly normal. The usual amount of fall seeding has been done, and is looking well. Onions are not grown here. The yield of potatoes would have been excellent, but they are rotting badly. Root crops, celery and late market-garden crops are little grown, but are doing well. Apples 25 per cent; pears half a crop; peaches three-fourths; cranberries half a crop. The long spell of wet weather has delayed the filling of silos and all farm work.

Dana (LYMAN RANDALL). — Corn is fully up, and perhaps a little above the normal. Rowen and fall feed are not up to the usual average. There has been but little fall seeding done, but what is in looks well. Not many onions are raised, and what few there are have not done well. Potatoes are not up to the average in yield, but are of good quality. The prospect is good for all root crops and late market-garden crops except turnips and cabbages, which are very poor. Apples and pears are a very small crop; peaches and grapes have been good; cranberries are a fair crop.

Petersham (D. F. BIGELOW). — The corn crop is a good one. Rowen is a full normal crop, and fall feed is in good condition. Very little fall seeding has been done. Onions are not raised hereabouts. Potatoes are yielding well, but are rotting. Since the rains everything has grown wonderfully, and late market-garden crops promise well. Fall apples are not plenty, winter varieties two-thirds of a crop; peaches, pears and grapes good crops.

Phillipston (A. D. CLIFFORD). — Indian corn is a little below the average. Rowen and fall feed are much better than usual. Not much fall seeding is done here. There is a large yield of potatoes, but at least three-fourths are rotting. Root crops and other late market-garden crops are rather below the average in condition. There is one-third of a crop of apples and pears; good crop of peaches; a fair crop of native grapes.

Templeton (LUCIEN GOVE). — Corn is a full average in growth, but about two weeks late, and needs more sunshine. Rowen and fall feed are better than usual. Owing to lateness of haying and much wet weather, less than the usual amount of fall seeding has been done, but what is in is in good condition. Onions are not raised to any extent. Potatoes are a light yield, and are rotting freely. The latter part of the season has been favorable to root crops, celery and other late market-garden crops, and they are now quite good. Apples light and of poor quality; pears medium; no peaches; grapes late; cranberries not raised. September has been unusually cloudy, with heavy precipitation. The milk supply holds up wonderfully.

Winchendon (ARTHUR STOCKWELL). — Indian corn is an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions compare well with a normal crop. Potatoes are a good average crop. Root crops, celery and other late market-garden crops promise finely. Fruit of all kinds will give fairly good yields.

Fitchburg (DR. JABEZ FISHER). — Corn is of sturdy growth, but a little late. Rowen and fall feed are not up to the average in yield, but are fully up in appearance. Potatoes are less than a normal yield, and are rotting considerably. The prospect is good for root crops, celery and other late market-garden crops. Apples are not more than a one-fourth crop; pears 80 per cent; peaches 80 per cent; grapes 70 per cent; peaches lack sugar, and grapes are liable to be overtaken by frosts, in consequence of much cloudy and cool weather.

Sterling (HENRY S. SAWYER). — Corn is fully up to a normal crop. Rowen and fall feed are up to the usual average. Very little fall seeding has been done. There is a very poor crop of potatoes. Root crops, celery and other late market-garden crops are looking well. There is a good crop of apples, peaches and pears in this locality; winter apples selling for \$2 per barrel, peaches from 60 cents to \$1 per basket.

Bolton (H. F. HARNES). — Indian corn is fully up to the normal. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done, and is looking well. Few onions are grown. The quality of the potato crop is not very good, and the yield is possibly three-fourths of the normal. The prospect for root crops, celery and other late market-garden crops is good. Few apples; pears and peaches good; full crop of grapes.

Worcester (SILAS A. BURGESS). — There is a good average corn crop. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done, and it is in good condition. There is a good average crop of onions. Potatoes are about normal in yield and quality. The prospect is good for root crops, celery and other late market-garden crops. There is a small crop of apples and pears; peaches and grapes fair. The continuous rains have benefited grass and some other crops.

Shrewsbury (FRED J. REED). — Corn is a fair crop. Rowen is up to the normal, and fall feed is better than usual. The usual amount of fall seeding has been done, and it is in good condition. The onion crop is about a normal one. Potatoes promised to give a good yield, but are rotting badly. The prospect for root crops, celery and other late market-garden crops is very good. Fruit of all kinds is yielding very well.

Oxford (D. M. HOWE). — There is a medium crop of Indian corn. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done, and is in good condition. Onions are an average crop. Potatoes are about half a crop, and are rotting. Celery looks finely. Apples and pears poor; peaches plenty; grapes fair; cranberries not very plenty. Farm crops on the whole look well, and cattle are in good condition.

Milford (JOHN J. O'SULLIVAN). — Indian corn is as good as usual. Rowen and fall feed are up to the normal. Less than the usual amount of fall seeding has been done, owing to wet weather. There are very few onions raised hereabouts. Root crops, celery and other late market-garden crops promise fairly well. Apples poor; pears and peaches good; grapes fair; cranberries good.

Hopedale (DELANO PATRICK). — Indian corn is above an average crop. The rowen crop was light, and fall feed is good. Not much fall seeding has been done. But few onions are raised in this vicinity. There is an average yield of potatoes, and considerable complaint of rot. There is a full average crop of root crops, celery and other late market-garden crops. Apples were never so few and poor; pears, peaches and grapes have yielded well.

MIDDLESEX COUNTY.

Sherborn (N. B. DOUGLAS). — Indian corn is much above the average. Rowen and fall feed are up to the usual average, but owing to the frequent rains little rowen has been secured. Not much fall seeding has been done. Potatoes are rotting badly, many fields being nearly a total loss. Root crops, celery and other late market-garden crops promise fairly well. There is not more than 10 per cent of a normal crop of apples; pears and peaches below the average; grapes rotting and not ripening.

Sudbury (EDGAR W. GOODNOW). — The Indian corn crop is unusually large. The rowen crop and fall feed are up to the normal. The usual amount of fall seeding has been done, and it is looking well. The onion crop is about normal. Potatoes are below the normal in yield and quality. Root crops, celery and other late market-garden crops are looking well. The apple crop is light; pears, grapes and cranberries have turned out well.

Stow (GEO. W. BRADLEY). — Corn is about two-thirds of a normal crop. On early-cut fields rowen is good, but it will not average up to the normal crop. Quite a good deal of fall seeding has been done, and it is looking well. Potatoes are not doing as well as usual, and considerable rot is reported. Root crops, celery and other late market-garden crops are not much raised. Late

apples are small, as a rule; pears a very good crop; peaches fair.

Maynard (L. H. MAYNARD). — Indian corn has done exceptionally well this season, and is above the normal. Rowen and fall feed are not up to the average except on early-cut fields on low lands. The usual amount of fall seeding has been done, and it is looking well. There is a normal crop of onions. Potatoes are about three-fourths of a full crop, and many fields are rotting badly. Market-garden crops are about average in yield and quality. There are more apples than usual on off years, and, while small in size, they are smooth and fair. Pears and peaches are plenty; grapes are short, many vines winter-killing.

Westford (J. W. FLETCHER). — Indian corn is about an average crop. Rowen and fall feed are not up to the usual average. About the usual amount of fall seeding has been done, and it is looking well. Potatoes have made about a two-thirds yield, and are of good quality. Fruit of all kinds has yielded well in this section.

Dunstable (A. J. GILSON). — Corn is more than an average crop. The rowen crop and fall feed are above the usual average. The usual amount of fall seeding has been done, and it is in good condition. Onions are about a normal crop. Very few potatoes have been harvested, and the condition of the crop is uncertain. Very little market-gardening is done in this locality; roots of all kinds are light yields. There is a light crop of apples; pears, peaches, grapes and cranberries are quite plenty.

Tewksbury (G. E. CROSBY). — Indian corn compares very well with the normal. Rowen and fall feed have improved within the last two weeks. Not much fall seeding has been done near here. Onions have done well, except that they suffered much from insects the first of the season. Some fields of potatoes have been troubled with rot, others good. The prospect is generally good for root crops, celery and other late market-garden crops. Apples scarce; some pears and peaches; fair yield of cranberries.

Billerica (GEO. P. GREENWOOD). — Corn is a fair crop. Rowen and fall feed are nearly up to the normal. The conditions have been very good for fall seeding. Onions are a good crop. Potatoes are a very small yield, and are rotting somewhat. The prospect is good for root crops, celery and other late market-garden crops. There is a light crop of all fruits. The supply of milk has seemed to be short all summer.

Curlisle (E. J. CARR). — The corn crop will be about an average one. Rowen and fall feed are about up to the normal. Not as much fall seeding as usual has been done, but what is in is

looking well. Potatoes show a fair yield, but are rotting somewhat. Root crops, celery and other late market-garden crops are all looking well. Apples are a poor crop; pears, peaches, grapes and cranberries fair.

Concord (WM. H. HUNT). — Indian corn is fully up to the average. Rowen is up to the normal, the only trouble being that there has been so much rain lately that it is difficult to get it. About the usual amount of fall seeding has been done, and it is looking well. Yield of potatoes light, with some rot appearing. The prospect for root crops, celery and other late market-garden crops is good. We have had a fair quantity of early apples, but winter varieties are few; pears a little below average; peaches fair; grapes average.

Stoneham (J. E. WILEY). — Indian corn is below the normal. The usual amount of fall seeding has been done, and it is in good condition. Potatoes are very much below the normal in yield. Apples and pears are poor; grapes good.

Winchester (S. S. SYMMES). — Indian corn is not raised hereabouts. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in first-rate condition. Onions are small, and not up to the normal in yield. Root crops are not as good as usual; celery will be a good crop. Apples scarce; pears a light crop; peaches a heavy crop, but they all ripened at one time, and the market is glutted.

Weston (HENRY L. BROWN). — Indian corn is not grown to any extent in this locality. There is little rowen, but fall feed is good. Seeding is being done now; but little was done before the rain. Onions are not grown. Potatoes are a very small crop, not over a quarter of a normal yield in many places. Roots are doing well; celery only grown for home use, but is looking well. Fall apples have been quite plenty, not many winter ones; peaches not as good as usual; few grapes grown, and no cranberries. Grass is looking finely, but not much will be tall enough for cutting, as it was so late in starting.

ESSEX COUNTY.

Amesbury (F. W. SARGENT). — Corn is generally heavy, and will be a large crop if frost holds off a while longer. Rowen is a good crop except where timothy roots were injured by drought after early cutting of first crop. Fall seeding is in good condition, but seems to need sunshine to give it a start, most land being wet and cold with the frequent rains. Onions are fully a normal crop, and of good quality. Potatoes are hardly a full crop, and

there is considerable blight. There are few winter apples and grapes ; peaches in abundance.

Haverhill (EBEN WEBSTER). — Indian corn is fully up to the normal. Fall feed is good, but rowen is a little short. About the usual amount of fall seeding has been done, and it is looking well. Potatoes are light in yield and fair in quality. Root crops, celery and other late market-garden crops promise about normal crops. Apples half a crop ; pears one-fourth ; peaches good ; grapes fair. We have had a week of damp weather, with some rain ; good for the pastures, but bad for curing the rowen crop.

Groveland (A. S. LONGFELLOW). — Indian corn is better than an average crop. Rowen is a light crop. Not as much fall seeding as usual has been done, on account of heavy rains. Potatoes are rather light, and are rotting somewhat. The prospect is very good for root crops, celery and other late market-garden crops. Fall apples scarce, winter apples a good crop for an off year ; peaches quite plenty.

Andover (MILO H. GOULD). — Corn is late and rather backward. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is looking well. Onions are not raised in this section. Potatoes are below the normal in yield, and are rotting badly. The prospect is good for root crops, celery and other late market-garden crops. There is a half crop of apples ; pears the same ; peaches good ; grapes were destroyed in the spring by rose bugs ; cranberries about half a crop.

Rowley (D. H. O'BRIEN). — Indian corn is better than an average crop. Rowen and fall feed are up to the usual average. No fall seeding has been done as yet. Onions are an average crop. Potatoes are a small yield, and of poor quality. The prospect is good for root crops, celery and other late market-garden crops. Apples are below average ; pears a full crop ; peaches fair ; grapes medium ; cranberries poor.

Topsfield (B. P. PIKE). — All the corn raised here is sweet corn or southern corn for the silo, and there is a fair crop of both. Rowen is not quite as good a crop as usual. The usual amount of fall seeding has been done, and it is in good condition. Not many onions raised, and crop below average. Potatoes show a fair yield, but are rotting considerably. The prospect is fair for root crops, celery and other late market-garden crops. Apples and pears are of poor quality ; peaches good ; cranberries injured by the rains.

Hamilton (GEORGE R. DODGE). — What few fields of Indian corn there are seem to be fully up to or perhaps better than

normal. Rowen is a fair crop, better than predicted last month; fall feed good. Scarcely any August seeding was done this year, but quite a few pieces are being reseeded this month. No onions raised commercially. Potatoes are reported to be rather under a normal crop, but of good quality. All root crops look promising; celery and spinach about normal. Fall apples scarce and high in price, Baldwins, Greenings and Russets very fair; pears and peaches medium, but fruit undersized; grapes and cranberries not plentiful.

Manchester (JOHN BAKER). — Corn is better than a normal crop. Rowen and fall feed are excellent, owing to the wet weather. The usual amount of fall seeding has been done, and it is in excellent condition. Onions are little raised. Potatoes are rather a poor crop. The prospect is good for root crops, celery and other late market-garden crops. There will be good crops of all kinds of fruit.

NORFOLK COUNTY.

Cohasset (PHILANDER BATES). — Indian corn is not raised to any extent. Rowen and fall feed are both better than usual. Only a small amount of fall seeding has been done. Onions are less than a normal crop. Potatoes are good in yield and quality. Root crops and late market-garden crops promise well, but are raised for home use and not for market. Apples are a small crop; pears normal; peaches not raised; grapes a very light crop.

Canton (EDWIN V. KINSLEY). — Indian corn is an average crop, and is mostly grown for fodder. Rowen will be an average crop, thanks to the late rains; fall feed is good. About the usual amount of fall seeding has been done, and it looks very well. There is a light crop of onions, they being very much injured early in the season by maggots. Potatoes are very uneven, some fields being fine and others giving small yields; no rot noticed. The prospect is good for root crops, celery and other late market-garden crops. Apples are a very short crop; other fruits very good except cranberries. A scarcity of milk and increased demand for milch cows, with a jump in price for good ones, are noted.

Westwood (HENRY E. WEATHERBEE). — There is a good crop of Indian corn. The rowen crop and fall feed will both be up to the normal, although they have thickened up fast during the last ten days. About the usual amount of fall seeding has been done, and it is looking well. Very few onions are raised. There is general complaint that the potato crop will be light. Root crops, celery and other late market-garden crops are looking well. The

apple crop will be light, but peaches, grapes and pears will be good

Walpole (EDWARD L. SHEPARD). — Corn will be three-fourths of a normal crop. Rowen is below the normal, but fall feed is in good condition. Less than the usual amount of fall seeding has been done, but that put in is in good condition. Onions are a good crop. Potatoes are below the normal in yield, quality fair. Root crops, celery and other late market-garden crops are below the average in condition. Apples are half a crop; pears, peaches, grapes and cranberries fairly good crops.

Millis (E. F. RICHARDSON). — Indian corn is better than an average crop. Rowen and fall feed are above the normal. There has not been quite as much fall seeding done as usual, but it is in excellent condition. Onions are about an average crop. Potatoes are below the average in yield and quality. The prospect for root crops, celery and other late market-garden crops is good. There are short crops on all fruits except peaches.

BRISTOL COUNTY.

Mansfield (WM. C. WINTER). — Owing to very dry weather earlier in the season, the corn crop will be below the normal. On low land rowen is about a normal crop, on high land there is little or none; fall feed will be fair. Very little seeding has been done, and it is in fair condition. Potatoes are about a normal crop in yield and quality. Abundant rains make prospects on all late market-garden crops excellent. Apples are a small crop; pears good; peaches poor; grapes good; cranberries uncertain.

Norton (WM. A. LANE). — Indian corn is an average crop. There is a good crop of rowen, but no weather for harvesting it. About the usual amount of fall seeding has been done, and it is looking well. There are very few onions raised hereabouts. Potatoes are not as good as last year, and grubs are working badly on them. Root crops, celery and other late market-garden crops promise about average crops. There will be small yields of all kinds of fruit.

Seekonk (JOHN W. PECK). — Indian corn compares fairly well with the normal. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in favorable condition. Onions are not up to the crops of recent years. Potatoes are fully normal in yield, and of good quality. The prospect is very poor for root crops; celery is blasting, and making very slow growth; spinach was killed by the heavy rains. Apples

and pears plenty ; grapes very small and scarce. Fall lettuce and beets are fairly good ; cabbages abundant.

Dighton (JAMES N. PAUL). — Indian corn is a good crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, but it is too early to say as to its condition. Onions are about half a crop. Potatoes are about half the normal in yield, and of good quality. The prospect is good for root crops, celery and other late market-garden crops. Apples good ; pears poor ; peaches good ; grapes poor ; cranberries not grown. Strawberry plants have made a good growth, and the beds are looking well.

Berkley (ROLLIN H. BABBITT). — Indian corn is fully up to the average, but is about two weeks late. About the usual amount of fall seeding has been done, and it is looking well. Potatoes are much below the normal in yield, but are of good quality. The prospect for root crops, celery and other late market-garden crops is very good. There is a light crop of apples ; pears and peaches plenty ; grapes scarce ; cranberries half a crop.

Westport (ALBERT S. SHERMAN). — The corn crop is better than it has been for many years. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done, and it is in fine condition. There is a large crop of onions. Potatoes are of good quality and large yield, but are rotting badly. Turnips and cabbages will be large crops ; celery not much raised, but what there is looks well. Apples, pears and peaches plenty ; grapes and cranberries scarce. Apples are falling badly.

Dartmouth (L. T. DAVIS). — Indian corn is fully up to the normal, or a little better. Rowen is below the usual average. Very little fall seeding has been done as yet, but that put in is in fine condition. Onions are about an average crop. Potatoes are below most years in yield, and have rotted quite badly on some fields. The condition so far seems to indicate a full yield of root crops and late market-garden crops. Apples 60 per cent of normal yield ; pears 75 per cent.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Indian corn is about an average crop. Rowen is in good condition on moist land ; feed in pastures looking well. The usual amount of fall seeding has been done, and it is in good condition. Onions are not over 75 per cent of a full crop. Potatoes are about 80 per cent of a normal yield. Root crops that had got started are looking well ; celery is late, but is growing well now. The prospect is not very good for fruit of any kind.

Marshfield (JOHN H. BOURNE). — Indian corn is a good crop on rich, moist land, and a small one on dry or weak land. The rowen crop has improved greatly with the rains of the past month. The dry weather retarded the growth of onions, making them of small size. Less than the usual amount of fall seeding has been done, owing first to drought and secondly to too much rain. The prospect for root crops, celery and other late market-garden crops is fine. Some fruits have done well, but as a whole will give small crops; cranberries nearly a failure.

Pembroke (NATHANIEL MORTON). — Indian corn is not quite up to the normal. Rowen and fall feed are up to the usual average. Less than the usual amount of fall seeding has been done, but it is in fair condition. Onions are not raised in quantity, only a few for home use. Potatoes are below the normal in yield, but are of fair quality. No market-garden crops are grown. Apples are small and wormy; pears abundant; peaches few; grapes below the normal; cranberries about a two-thirds crop.

Duxbury (R. T. RANDALL). — Corn is about a normal crop, but late. Rowen is a good crop, but wet weather injured that cut; fall feed good. Not much fall seeding has been done, but the condition is good, except that it is backward. There is a good crop of onions in some localities. Potatoes are a failure from blight, rot and grubs; some farmers who had hundreds of bushels to sell last year will have to buy this year. Root crops, celery and other late market-garden crops are about the same as usual. Apples are plenty; pears, peaches and grapes scarce; cranberries wormy and scarce.

Kingston (GEORGE L. CHURCHILL). — Indian corn is up to the standard of a normal crop. Rowen and fall feed are in excellent condition. The usual amount of fall seeding has been done, and it is in good condition; not much done at any time hereabouts. Onions are not much raised. Potatoes are not as good a crop as usual. What root crops and late market-garden crops there are, are about as in other years. Apples are a small crop, and not of very good quality; pears are poor; grapes poor; cranberries one-third crop.

Bridgewater (ROWLAND CASS). — The corn crop is a good average one. Fall feed and rowen are above the normal. Less than the usual amount of fall seeding has been done, but that already put in is in good condition. But few onions are raised in this locality, and these are below the normal. Potatoes are a fair crop, but rot is prevalent in this neighborhood, and will materially reduce the yield. Apples are a poor crop; pears, peaches and grapes in good supply.

Carver (J. A. VAUGHAN). — Indian corn compares well with a normal crop. There is a large crop of rowen, but bad weather to make it. The usual amount of fall seeding has been done, and it is in good condition. No onions are grown here. Yield of potatoes large; some rot on low ground. The prospect is good for root crops, celery and other late market-garden crops. But few apples and pears, and no peaches. The cranberry crop in this section will be very light. The vines on dry bogs winter-killed badly; there was a full blossom, but the crop did not set well; and the fruit worm has been very destructive.

Lakeville (NATHANIEL G. STAPLES). — Indian corn is hardly an average crop. Rowen and fall feed are in good condition. The usual amount of fall seeding has been done, and it is in good condition. Onions will be about a three-fourths crop. Yield of potatoes three-fourths of the normal, and quality good. Prospect for root crops, celery and other late market-garden crops fair. Apples poor; pears few; peaches fair; cranberries about half a crop.

Rochester (GEO. H. RANDALL). — Indian corn is a very good crop. Rowen and fall feed are up to the normal. About half the usual amount of fall seeding has been done, and it is looking well. Onions are about half a crop. Potatoes are half a crop or less, of fair quality. The prospect for root crops, celery and other late market-garden crops is very good. Fruit of all kinds will be a smaller yield than was estimated.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Corn is fully up to a normal crop, where not rusted. Rowen and fall feed are more than normal. The usual amount of fall seeding has been done, and it is in good condition. Onions are a poor crop, having blighted; not over 30 per cent of a normal crop. Potatoes are a three-fourths crop in yield, with rot, some fields not being worth harvesting. Late market-garden crops and root crops look well. Apples, pears and peaches are failures; grapes and cranberries small crops. The season has been one of the worst ever seen, all crops suffering from blights except grass, which never was better in pastures and mowings in the past sixty years.

Mashpee (W. F. HAMMOND). — The corn crop is about an average one. Rowen is above the normal, and fall feed is about average. Less than the usual amount of fall seeding has been done, but it is looking well. The onion crop is about average. Potatoes are about normal in yield and quality. Late market-garden crops

will be above the average. Apples and cranberries half crops; pears, peaches and grapes one-fourth crops. Frost did considerable damage to cranberries and some field crops on September 14.

Barnstable (JOHN BURSLEY). — Indian corn is 85 per cent of a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, and it is in good condition. Potatoes are nearly a full crop, but there is some complaint of decay. Turnips are very small in size. Apples are half a crop; pears very light; peaches fair; cranberries not over half a crop.

Dennis (JOSHUA CROWELL). — Corn is just about a normal crop. Rowen and fall feed are up to the usual average. Onions are hardly a normal crop. Potatoes have made a very good yield, but have been badly eaten by white grubs. The prospect for root crops, celery and other late market-garden crops is very fair. Fruit of all kinds is very much below the average. There is the smallest crop of cranberries for many years.

Chatham (E. Z. RYDER). — Indian corn is an average crop. Rowen and fall feed are very good. There is an average amount of fall seeding done, but it is too early to form an opinion as to its condition. The onion crop is very small. Potatoes are about an average crop. Turnips are looking fairly well; celery not grown. Apples are a small crop; pears and peaches less than average; cranberries about half a crop. The fruit worm destroyed many cranberries, and the weather conditions have been unfavorable.

Eastham (J. A. CLARK). — There is a small acreage of Indian corn, but what there is looks well. The rowen crop and fall feed are very good. The usual amount of fall seeding has been done, and it is in good condition. Potatoes are a fair crop. Turnips are the principal root crop, and show some blight, but it is too early to predict as to the crop. Apples light; pears plenty; no peaches; cranberries fair.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Indian corn is an average crop. Rowen and fall feed are about normal in condition. Not much fall seeding is done here. Potatoes are below the average, on account of rot. The prospect is good for root crops, celery and other late market-garden crops. The prospect is poor for all kinds of fruit, and those harvested have turned out poorly.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

COMMERCIAL PORK MAKING AND PIG RAISING IN NEW ENGLAND.

By A. A. SOUTHWICK, Farm Superintendent, State Insane Asylum, Taunton, Mass.

The question might be asked why we should engage in this industry in Massachusetts and New England generally, and the only answer can be, because there is an unlimited demand for the products of this immense and growing industry. Another reason is that our climate seems to be an ideal one for the thrift and general health of this class of animals. Again, I am most happy to say that we have right here the best grain-growing location in the world. True, many will say the hired help problem must be solved before we can branch out very much in carrying out an idea which would probably be considered an experiment with most farmers. To the doubting minds we would say, make a beginning, and the problem will solve itself.

BREED.

The question of breed is certainly an important one, because upon this, in many instances, will depend the value of the output. In a general way, a class of animals never should be chosen just because of the fancy of the owner. In every instance cater to the tastes of your patrons, because it is through them that your bank account will increase.

The hog, throughout the west, is universally termed the mortgage lifter; and the *lard hog*, so called, is most easily produced by the hundreds of thousands; but the bacon hog, the animal that produces the high-priced meat for our rapidly growing and fastidious population, is there a minus quantity. This being the case, there is every reason, and the best reason, for leaving out the lard hog in our experiment of meat production here in the east. I do not hesitate to say that the Yorkshire is preëminently the hog for the east, because of the unexcelled quality of bacon and hams produced. My own choice of breeds would be the Berkshire, at once equal to any as a pasture hog, equal to the best, perhaps, for the fine quality of bacon and ham produced. And this animal is

a pretty good lard hog, broad, and with thick pork on the back when well fed. The only objection, which is in reality no objection at all, is the color, which is black. No one ever heard a customer object to the color of a white hog, but this cannot be said of the black ones. So I say once again, in the selection of breeds choose the one that your customers demand.

We all have our likes and dislikes, — that is human nature; and so for this reason it is no use to expect that every farmer, although he may have all the requirements to perfection so far as location and surroundings are concerned, will engage in hog raising, because his interest is not in that direction; and I would say, in all honesty, if one is not interested do not engage in this business, because failure will be most sure to follow.

This business and the dairy should always go together, because, as the feed question is a very important one, milk from the cow, when possible, will produce that high quality and thrifty condition so much to be desired in the young pig when he is about ready to be put on sale, at the age of from six to eight weeks. The high price and demand for cream is in itself sufficient inducement for keeping the cows.

CARE.

The summer care of hogs is a comparatively easy problem, but it is, according as one is situated, not quite so easy in winter. Pasture and pure water are the perfection of feed for summer; and for winter, nice, succulent sugar beets, raw, early cut rowen and good fresh water, with a little warm slop of boiled up turnips, cabbage or squash and a little skimmed milk are just right for the breeding sows, small pigs and growing shotes, with a little addition of corn and ground grain, as barley, oats and corn, and a little of the best quality of wheat bran for the pigs that are nearing the dressing-off period. Some two or three weeks before killing time, eliminate turnips, cabbage and squash from the ration.

There is sale for small pigs in every neighborhood, especially in spring, and these pay the best of any part of the business; but the leftovers will go to pasture, and will turn most acceptably in the fall. Many a farmer will say, To what extent shall I go into this new departure? And to such I would say, Plan to have a carload on hand after supplying your neighbors with small pigs. After knowing how the business goes, then plan accordingly. A carload, one deck, is from fifty to fifty-five pigs, that will dress from one hundred and fifty to two hundred pounds each. Three acres of grass — not old, dried-up stubble — and an acre of rape will feed a carload of pigs throughout the season. Any of the good English grasses are all right, though clover is par excellence, if possible. Grass four inches high is perfect, and it should not be allowed to get beyond this. If the season is perfect and the growth rapid, turn in extra stock to keep it down, and remove when fed off sufficiently. If short periods of drought come on, try to irrigate, if possible. The acre of rape should be at one side, and divided so the pigs can feed

off the two halves alternately once in about ten days. This must be left out of the feed some three weeks before killing time. Mud holes and wallows must not be allowed in the pasture, but a trough of clear, running water, and a shallow tank of water set on a plank platform, into which the pigs can step easily and cool off, are indispensable. This arrangement should be beside a fence, where the waste water can escape. Every pig that goes to pasture must have a ring in his nose, then the perfect pasture will be preserved during the season. An exception to this might be useful where a wood lot has been cut off, and it is desirable to bring the land into tillage. A hundred eight-weeks-old pigs, well cared for, will fix this piece of stump land in an incredibly short space of time.

SHELTER.

An important item is shelter, and this must be perfect and very comfortable under foot. Clean white sand is all right for bedding until the weather gets cold, then add straw. This shelter is best arranged along a fence. Allow the single roof to pitch towards the fence, so the eaves water cannot contribute towards making a mud hole under foot. This shelter is very inexpensive, and is constructed by setting good posts in the ground every ten feet, eight feet away from the fence. Let the fence be the height for the plate on the back side, and saw the posts off on the front line two feet higher than the back. Spike on the plates, and fit in one midway between the front and back, so the roof will have a good support in the middle. Almost every enterprising farmer cuts some lumber from his place during the winter, and he would scarcely miss that used in this simple structure. I like to have the boards good length, — eleven or twelve feet is none too much, so there will be a good projection front and back. Double board, breaking joints carefully. As fast as nailed on, paint with some colored paint, to your taste. Use lead and oil, and you will be pleased at the nicely preserved roof. Fifty hogs in a bunch is enough in this part of the country, and all arrangements should be for accommodating this number. A shelter seventy feet long will be satisfactory. Do not let the material under foot become unsanitary, and be sure to safeguard against disease.

Something in the way of slop will be fed from day to day, as such material accumulates about the place, and so troughs must be provided. These can be preferably of cast iron, though good ones can be made of two-inch plank. Make a platform some sixty feet long and eight feet wide, flat on the ground, as level as possible, of two-inch plank, leaving an inch space between each plank, and fasten the row of troughs along the middle; this will last for years if covered with some two feet of old hay every fall, after the hogs have been disposed of. Do not feel obliged to feed these hogs unless convenient, and you have the offal to dispose of.

INFLUENCE OF HEREDITY.

In the pig business, heredity plays an important part, very much more so than the majority of farmers are aware of; and perhaps the best and most valuable example of this is noticed in the disposition of the brood

sow. The quality of good nature is just as certainly and accurately transmitted to the offspring as are the valuable qualities of the horse transmitted to the young colt. It is an impossibility, in a large herd, to have every sow good natured at farrowing time; but it is easy enough to have the cases of bad temper so far apart that any occurrence of this kind is not worth mentioning. There may be extenuating circumstances that might cause a valuable sow to behave unbecomingly, but this should not be sufficient reason for discarding her or her pigs for breeders. If a sow is cross two litters in succession, dispose of her without hesitation, and do not retain any of her pigs for breeders. The perfect mother bunches her brood in a remote corner of the pen, and settles herself some feet from them. Prize such litters highly, and save every pig for breeders, especially if they are good ones. Hardly a day passes without some seeker after knowledge asks the question, How long do you keep both sows and boars for breeders? And I invariably answer, As long as they do well. We have a pair of thoroughbred Yorkshires that have produced five hundred dollars' worth of pigs since we have had them; and the remarkable thing about it is, that they never have produced a poor one. They are five years old, and I think the last litter, which we now have on hand, is the best of any yet. It is easier to raise ten good sows than one good boar, and we meet a great many farmers who understand this. Select this animal from a litter whose ancestors are noted for the good qualities that should be combined in the perfect hog. Look for one that is as good over the hips as over the shoulders. You will not find this kind plentiful. Object to a coarse, heavy head in the young boar, but a different appearance is admissible in the aged animal. For myself, I do not object at all to some length of nose, provided that member is fine; my main idea being that a good, well-developed and rounded body behind that nose is of very much higher importance. The boar is fit for service at eight months old, and the sow can produce her first litter at twelve months old.

DISEASES.

The diseases which trouble the pig grower are comparatively few, and he can be reasonably safe from loss by keeping close watch of sanitary conditions. Do not compel the pigs to lie in wet, muddy nests over night, and never let an animal get chilled; because pneumonia is just as likely to attack the pig as the human subject; and, although the case is quite liable to recover, it is an unfavorable state of things, and not wanted. The most to be dreaded of all the diseases is swine plague or hog cholera. First of all, do not allow any one to come about your premises who has been where this exists. When it occurs, if the animals are in pens, wash the sides and floor with a saturated solution of sulfate of iron, and fumigate thoroughly every day with burning tar and brimstone. The fumes will not affect the animals, as the smudge will not be likely to settle in the pens. Feed charred corn, plenty of charcoal, and keep a fresh supply of coal ashes in the pens or pasture all the time. With reasonable care, disease of any kind need not be feared very much.

Small pigs at three weeks old or thereabouts are sometimes affected

with looseness of the bowels. This is a natural condition with all young creatures, and, so far as I can see, does no harm unless the trouble finally affects the physical condition of the young creature. The cause of this unfavorable feature is easily noticed as due to a variety of causes. The presence of some foreign substance very unfavorably affects the delicate mucous lining of the intestines, and the resultant inflammation appears in the disagreeable looseness of the bowels. This condition causes more or less fever, and the young things will be noticed sipping the filthy liquid about the pen. Also they will root about the walls for any old, filthy, dried-on material that they can find to swallow. Fortunately, this condition does not last very long; and, if the surroundings can be immediately changed to the fresh, sanitary conditions necessary, not much loss will result. If the sow cannot be moved to a perfectly clean pen, wash the old quarters perfectly clean, and keep them so for a few days. At any rate, do not allow the young pigs to drink or take any filthy matter into the stomach. Keep constantly fresh sod and fresh coal ashes in such pens. Occasionally a sow is too milky, and the young pigs get overfed; but this seems to do little harm in the long run. The best condition that can possibly come to these young pigs is to get them out in the open air and sunlight, and on the fresh ground. It may be considered that unusual space has been given to this portion of the subject; but if one can judge from the frequency of complaints so far this season, this poor condition of the small pigs is a very serious one.

SHOW ANIMALS AND THOROUGHBREDS.

The finest pigs, in fact, the show animals, are raised during the summer, giving them free access to as much variety of range as possible; furnishing them with a trough by themselves, where they can consume plenty of milky swill; and every morning early treat them to six quarts of old corn to every hundred pigs. Customers will not complain at the price of these pigs, whatever that may be.

The breeding of thoroughbreds is a business by itself, and should not be undertaken by any one who cannot be strictly honest in keeping his records straight, and who is not willing to go outside for fresh stock every little while. It is scientific work, and requires keen judgment to decide what really constitutes a first-class animal. One must be an expert in order to mate up the Berkshires to get the most satisfactory results. It has been some twenty-five years since my own experience with the breed, and I am truly sorry to see so many coarse heads among some of the highest-priced animals. The subject of crossing breeds should not be ignored, because many a neighborhood is well stocked with good ordinary hogs, which can produce very satisfactory and paying results by simply introducing a thoroughbred boar of high individual excellence. The most sensible course to be followed would be to use the stock as it is found in a neighborhood, and gradually introduce a better foundation.

MARKETING.

The question of marketing is an important one. Every neighborhood, village and even large cities contain families who salt down their yearly

supply of pig pork as surely as the year comes around. This class of custom pays the best of any, and can be secured by a little advertising; and if a good, neat article is always forthcoming, this trade can be kept for a lifetime. All who engage in this business will not care to sell in a small way here and there, and so many of the bunches must be sold by the car load; and, as a rule, choice lots are sought by rival firms, and almost without exception most satisfactory prices are obtained. Personally, I like the plan of culling out the best as they come on, and disposing of them in small lots to local markets or private customers at ruling prices. Split the animal neatly from end to end, wash perfectly clean with a profusion of cold water, and your customers will praise the neat appearance of your goods. The greatest amount of money would be secured by curing the various parts of the animal in the most up-to-date manner, and selling directly to those who will consume the meat.

IMPROVEMENT TO THE FARM.

The improvement to the farm because of the introduction of this new industry can hardly be realized. Heavy crops of horse hay can be grown, and the product turned into money. Heavy crops of corn, oats and barley can and should be grown for the support of the various animals kept. Up-to-date machinery must be an important factor in carrying out these plans, because of the scarcity of good farm help. In order to make a beginning, an equipment in the way of stock and accommodations must be gotten together, because brood sows and perhaps some fattening pigs must be wintered over. This wintering over of a good stock pays in more ways than one. The improvement of the farm will be rapid from the large accumulations of manure that must result from this course of farming. As already mentioned, large amounts of first-class horse hay can be grown and turned into money. A gentleman in a near-by town recently told me that he had harvested eighty tons of the best hay he ever saw stored; and, said he, "I have no use for it whatever, so I put it on the market, and every ton brings twenty dollars. My hogs, which I am obliged to keep to clean up refuse, are responsible for this condition of things on my place." This is only one of many instances where hogs are proving a very remunerative adjunct in the farm economy.

ACCOMMODATIONS.

As for accommodations, start in with what you have, and if you are prospered, you will feel encouraged to arrange more comfortably. Ten good brood sows and a boar is a reasonable number to start with. Some one will say it will not do to count your chickens before they are hatched; but with reasonable success this outfit ought to produce one hundred good pigs every time the sows breed. This season Yorkshire sows have produced remarkably large litters,—in almost every instance from twelve to twenty. With very good care and plenty of milk, every pig could be raised if the sow has a good teat for each one. Almost every New England farm has its variety of buildings and sheds, and with a little good calculation and ingenuity good quarters can be arranged for

the winter season. If it were only possible to get farmers to realize that it is not at all necessary to have expensive quarters in order to get the best results, we should hear of more successes and less of failures. Neat, well-arranged quarters are to be advocated; but something of a more primitive nature is preferable to a heavy debt at the start. Let the idea of perfect comfort predominate in every arrangement that is made.

As farrowing time approaches, be sure the sow is in a pen with a good strong rail or plank around the sides, standing out some fifteen inches, and a foot from the floor. A careless mother will lose some pigs, the best you can do. Should the sow be cross, remove the pigs as they come, to some very dry and warm receptacle. About as good and convenient an arrangement as can be made is to fill a large can with hot water, stand it in the middle of a box, wrap about it enough bags or old blankets so the pigs will not be in danger from burning, and let the little fellows occupy this till the sow takes them good naturedly, which perhaps may be after two or three have been born, perhaps not till she is through, and in extreme cases in three or four days. After a reasonable time the young ones must have some nourishment, and the sow must be carefully placed on her side and held down till the youngsters have filled themselves. Many advocate the idea of not feeding the sow till the pigs are twenty-four hours old; and the plan works all right, but a little warm water to drink will do no harm. Great care should be taken not to overfeed the sow for the first two weeks.

ARRANGEMENT OF PLANT.

If the business goes well, many farmers will feel encouraged to continue, and the question of a well-arranged plant will come up for consideration. Opinions will differ as to which is the better, all things considered. — one or two very long buildings, or a number of smaller ones systematically arranged, so the effect when viewed from a distance will be pleasing. Both plans have their advantages, and both can be managed successfully. The colony of small buildings has the advantage if disease of any kind breaks out, because at the start probably not more than one lot would be affected, and I consider this isolation of great value. The work of caring for a herd of any size would be less in a long building; still, there would not be very much difference with either system well started. Buildings of any considerable magnitude would refer to the winter management of the stock. In case a long building is thought best, arrange the pens on each side of an alleyway six feet wide, with a track in the middle for a swill tank. The pens should be about ten feet square, though all these dimensions can be changed to suit the fancy of the owner. The floor can be of any material, but the most satisfactory I have tried is to pave with brick. Second-hand brick are all right, and sometimes can be gotten for the asking. In cold weather enough bedding must be used to keep the animals off the floor. The hoof of the hog is very sharp, and will cut through concrete floors in a very short time. Plank floors must be replaced too often. If the small buildings are thought to be preferable, about ten by sixteen feet, with

single roof, is a good size. These buildings can have plank floors, sufficiently off the ground to allow cats to move freely about underneath, because rats and mice will trouble more or less, unless a few good cats are kept. With this precaution, little trouble may be anticipated from this source. This set of buildings can be so arranged as to give the premises a very pleasing appearance. Arranged one after the other in a straight line, and about six feet apart, the work of caring for the stock would not be pleasant, of course, in snow storms; but, aside from this, the plan would work well. For high-priced stock I like this plan much the best. They can be made more comfortable, and in case of disease the loss would be reduced to the minimum. Free ventilation is an absolute necessity. Plenty of sunlight should be admitted.

WINTER FEEDING.

The summer pork will not cost much, but in winter quite an amount of feed must be provided. I heard a farmer once make the remark — and he was a man who knew what he was saying — that, with corn at a dollar a bushel and pork at seven cents a pound, it paid well to keep hogs. There are so many circumstances and such a variety of conditions under which this class of stock is kept, that instances could be cited where the meat would cost double what it would sell for. Enterprising farmers will produce the greater part of the feed consumed, and this should be charged to the business at what it has cost to produce it. Very much of the feed that a pig has consumed up to five months old does not stand for any value at all.

CITY SWILL.

A word in regard to city swill, so called. Men of the soundest judgment do not hesitate to say that this is the best material for growing the pig; and I think there is no doubt as to the correctness of the statement. The manner of feeding it is in too many cases wrong, and some of it is not worth the hauling; but that collected from hotels, large boarding houses and the like is the best of hog feed. Just before feeding this should be treated with just scalding water sufficient to warm the mass. It is of importance to consider the temperature of the feed. It may be all right to feed cold swill, but we do often hear of outbreaks of disease that can be traced directly to the faulty condition of the feed. During my nearly forty years, which has been almost continuous, in the pig business, disease has not troubled in any form, and I do not remember of feeding cold swill at any time. This would seem to be a safe method to follow, but I doubt not many who feed cold swill are equally successful, and in this one must be his own judge as to the safety of the course to be followed.

WHEN TO SELL.

The good, solid, satisfactory income will depend upon the quality of the pigs being fed. If a pig is kept eight months when fully as good results should have been obtained in six, the profit is not anything as good as it should be. A pair of thoroughbred Berkshires, both barrows,

fed on good growing swill, with a finishing-off the last three weeks of as good feed as we could give them, dressed four hundred and five pounds at six months old. This is no enormous weight, and instances can be cited of very much larger weight at this age; but the quality was perfect, and the price obtained was all right.

When to sell is a nice question to decide. As a rule, I have found it best when the pigs are ready and a customer is on hand; but sometimes a delay of a few days might mean one hundred and fifty dollars more on a car load. On the other hand, some disease might break out, and spoil the whole deal. So the owner must be his own judge in the matter. If the pigs are just the right weight and quality, an extra three weeks' gain might be detrimental to a profitable sale. Close watch of market conditions and good judgment are the best guides.

FENCING.

The subject of fencing is worth considering. If a field of some three acres is well fenced with stone wall, the pigs ought to keep their place. But if larger fields must be divided, there is nothing superior to woven wire, three feet high. An excellent thing to do, when sweet corn gets well filled out and in the milk, is to drive along this fence with a small load, and throw in about two stalks to each pig. The corn is much relished, and they seem to chew the stalk for the juice.

It goes without saying that the writer is interested in this pleasant and profitable branch of farming, and has made this class of stock a life-long study; and, although a despised animal, the hog is a very interesting thing in nature. No two are alike in disposition and peculiarities, and a new set of ideas must be studied up for the management of each.

I look for increasing interest along this profitable line of farming, although I appreciate the strong hold of the two rival industries,—dairy and poultry farming. There is room for all of them, and plenty of chance for improvement.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF OCTOBER, 1905.

CLEAN MILK.

*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

BOSTON :
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1905.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

CROP REPORT FOR THE MONTH OF OCTOBER, 1905.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Nov. 1, 1905.

Bulletin No. 6, Crop Report for the month of October, is presented as the final issue of the season. We wish to thank our correspondents for their free and faithful assistance, through which we have been able to publish these reports, and trust that they will be able to serve us in the same capacity when the next spring shall be with us.

The special articles printed this year have been : Bulletin No. 1, "The management of mowings," by Prof. Wm. P. Brooks ; Bulletin No. 2, "How to supplement a short hay crop," by Prof. Charles S. Phelps ; Bulletin No. 3, "Bush-fruits," by Prof. F. S. Card ; Bulletin No. 4, "Practical poultry housing," by John H. Robinson ; Bulletin No. 5, "Commercial pork making and pig raising in New England," by A. A. Southwick. We have a limited number of Bulletins No. 1, 2, 4 and 5 on hand, which we shall be glad to send to any desiring them. The supply of Bulletin No. 3 is entirely exhausted, but we shall have a reprint of the article on bush-fruits later on, and any requests for the same will be placed on file and filled as soon as possible.

Particular attention is called to the article at the close of this bulletin, entitled "Clean milk : some suggestions for the average producer," by P. M. Harwood, general agent of the State Dairy Bureau. Mr. Harwood is in a particularly good position to make suggestions on this subject, as he is able to look at it from more than one standpoint, having himself been a milk producer for the Boston market, and having visited, in his work for the Dairy Bureau, a great many dairies, and investigated present conditions, both of production and consumption.

PROGRESS OF THE SEASON.

The Crop Estimating Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for October, 1905) finds the condition October 1 to have been 89.2, as compared with 89.5 a month earlier, 83.9 in 1904, 80.8 the year previous, and a ten-year average of 80.2.

The preliminary estimate of the average yield per acre of spring wheat was 14.7 bushels, subject to revision on final returns. The average quality October 1 was 89, as compared with 75.7 in 1904 and 85.5 in 1903.

The preliminary returns indicate an oat crop of about 939,332,000 bushels, or an average of 33.9 bushels per acre, as compared with 32.1 bushels in 1904, 28.4 bushels in 1903, and a ten-year average of 29.2 bushels. Quality 92.4, against 91.4 in 1904 and 79.9 in 1903.

The preliminary estimate of yield per acre of barley is 26.7 bushels, against 27.2 bushels in 1904, 26.4 bushels in 1903, and a ten-year average of 25 bushels. Average quality 86.2, against 88.7 in 1904 and 85.4 in 1903.

The preliminary estimate of yield per acre of rye is 16.6 bushels, against 15.2 bushels last year, 15.4 in 1903, and a ten-year average of 15.2 bushels. Average quality 92.6, against 91.6 last year and 88.4 in 1903.

The average condition of buckwheat October 1 was 91.6, as compared with 91.8 a month earlier, 88.7 in 1904, 83 in 1903, and a ten-year average of 82.4.

The average condition of flax October 1 was 91.5, as compared with 94.2 a month earlier, and 87 in 1904.

The average condition of tobacco October 1 was 85.8, as compared with 85.1 a month earlier, 85.6 in 1904, 82.3 in 1903, and a five-year average of 79.1.

The average condition of potatoes on October 1 was 74.3, as compared with 80 a month earlier, 89.5 in 1904, 74.6 in 1903, and a ten-year average of 76.

In Massachusetts the average condition of corn October 1 was 94; the average yield of oats 32 bushels, and the quality 95; the average yield of rye 15.5 bushels, and the average quality 91; the average condition of buckwheat 91; the

average condition of tobacco 96; the average condition of potatoes 73; the average condition of apples 52; and the average condition of grapes 75.

MASSACHUSETTS WEATHER, 1905.

[FURNISHED BY WEATHER BUREAU, BOSTON.]

The weather of January was of the midwinter type, somewhat intensified, particularly with regard to temperature, the monthly mean ranging several degrees below the January normal in all sections, and the cold weather being continuous, without the usual mild period. The precipitation, mostly snow, did not depart greatly from the monthly average, but the snow was badly drifted, thus impeding railroad and street car traffic.

February was a cold month, with a marked prevalence of fair weather, the monthly mean, 19.8° , being one of the lowest of record. The precipitation, averaging 1.67 inches, was much below the monthly normal, and mostly in the form of snow, but, owing to the low temperature, the ground was generally covered with snow throughout the month.

The weather of March was exceptionally pleasant for this month, there being an entire absence of the severe storms frequently prevalent. The temperature was lower than the average until the closing decade, when there was a sudden change from winter to spring-like weather. The snow and ice disappeared gradually and there were no destructive freshets. Weather conditions were unfavorable to the flow of sap. At the close of the month the ground was generally bare.

April was very pleasant, there being no marked departures from the average in the several elements of temperature, precipitation and sunshine. The day temperatures were generally below the average, while the night temperatures did not fall as low as usual in April. The precipitation, while somewhat below the average, was well distributed. The weather conditions were generally favorable to farming operations.

May opened with cool weather until the 6th, when there was a marked rise, with temperatures above normal until the

12th. From that date to the 24th the weather was decidedly cool, the daily mean temperatures ranging from 2° to 10° below the normal. From the 25th to the close of the month higher temperatures prevailed. Frosts occurred from the 14th to the 24th, with some damage to tender vegetation. There was much cloudiness and unsettled weather, but also a marked and general deficiency in rainfall, it being but little over half of the normal amount for May. High winds also prevailed, adding to the droughty conditions.

During the first five days of June the nights were cool, with only moderate day temperatures and little or no rainfall. From the 6th to the 8th cloudy weather and general rains prevailed, but the temperature continued low, with light frosts on the 9th. Following the 9th the temperature was higher and the nights were seasonably warm. On the 18th a period of cloudy weather began, extending through the 22d, with heavy rainfall, 2 inches or more in some sections. The temperature remained low, but with clearing weather rose to slightly above the normal. Considering the month as a whole, the temperature averaged below normal, the rainfall much above normal, and the sunshine slightly below the usual amount.

Cool weather prevailed during the first four days of July, with showery, unsettled weather, but from the 5th to the 20th high temperatures prevailed, both for the days and nights, with humidity from 15 to 20 per cent above the average. The warm weather was broken on the 21st and comfortable conditions prevailed until the end of the month. The rainfall was exceptionally light, except in a few instances of severe local storms, when heavy downpours of rain occurred. The month as a whole was very near the normal as regards temperature, the cool weather of the opening and closing days offsetting the warm period. The rainfall of the month was one of the smallest of record for July.

August opened cool and cloudy, with local showers. Following the 2d there was nearly a week of fair weather, with temperature ranging from 80° to 87° during the day. From the 8th to the 13th unsettled conditions prevailed, with local showers and thunderstorms. The 13th and 14th

were clear, but the 15th and 16th were again stormy. From the 16th to the 24th generally clear weather prevailed, with light to moderate rains on the 24th and 25th, with generally fair weather until the close of the month. The temperature for the month as a whole was nearly normal, and the rainfall somewhat below normal, though not enough so to cause damage.

September opened with overcast, unsettled weather, followed by a general downpour on the 3d and 4th, the rainfall being remarkably heavy, exceeding in most instances the normal fall for the month. Clear to partly cloudy weather followed to the 10th, after which there was a week of cloudiness, rains and fogs, with light rainfall. The temperatures of the month did not depart greatly from the September averages. The day readings were somewhat below seasonal, while the nights were generally warmer than usual. Cool spells were general on the 14th and 15th, and also the 26th and 27th, with light frosts in the interior. As a whole the weather was very unpleasant for September.

WEATHER FOR OCTOBER.

The weather throughout the month was unusually pleasant, and in some of its elements quite abnormal. There was almost continuous sunshine, there being only four days on which the skies were wholly overcast. Naturally, with so many clear days the rainfall was light. Light showers occurred in some part of each week, but rainfall was small in about all instances, and in many localities the amounts were too small to measure. The total rainfall of the month, in most localities, was the smallest for October in many years. At Boston it was the smallest, with a single exception, 1897, of any October in the past thirty-three years. Taking the month as a whole, the temperatures ruled high, and the average daily excess was about 2°. During the period from the 15th to the 20th the mercury ranged unusually high, reaching the 80's in some localities. The closing decade was, however, quite cool, with the temperatures on several days decidedly below the seasonal average, during which killing frosts occurred, and in many sections freezing weather

was experienced. Generally speaking, the weather of the month was of the type popularly known as "Indian summer," *i.e.*, warm and sunny, with light winds, clear to hazy skies and beautiful sunsets. The exceptionally pleasant weather was very favorable to all outdoor pursuits, and particularly so for farm operations. The housing of crops, fall plowing and cultivation and seeding progressed rapidly, and under most favorable conditions. Pastures and meadows continued green, supplying abundant feed for stock, which will begin the winter in excellent condition. At the close of the month there is need of rain in many sections.

CROPS OF THE YEAR.

The weather of May was so cold and dry that at its close all vegetation was very backward and much in need of rain. Pastures and mowings wintered well, but owing to the lack of rain there was little feed in pastures, and mowings were also backward, but with a good bottom growth. There was a fair bloom of apples, for an off' year, and the bloom of pears, peaches, cherries and plums was unusually heavy. Strawberries bloomed full though late. There was very little injury from frosts. Few insects appeared and did little damage. Spraying was practically confined to farmers making a specialty of fruit, and while all use insecticides on their potatoes, comparatively few use fungicides to prevent rot. Farm help was fairly plenty; average wages, \$20 per month with board, and \$1.50 per day, or higher, without board. There was a slight increase in the acreage of corn and decrease in that of potatoes.

Insects did less damage than usual in June. Indian corn was from a week to ten days late, but of good color and growing fast. Haying was just beginning at the close of the month, with close to an average crop of good quality. The acreage of forage crops was materially increased. There were numerous reports of poor germination of potatoes and the crop was uneven and backward. Early market-garden crops generally yielded well, with prices somewhat lower than usual. The flow of milk was well maintained, with prices for butter and butter fat higher than for some time.

Dairy cows were somewhat easier to obtain than formerly, with prices a little lower. Pastures were short and dry the first of the month, but improving materially towards its close. Strawberries promised a fair crop; cherries were an excellent crop; plums and pears promised only light yields; peaches set well; apples promised well for a non-bearing year.

Potato bugs were more common in July than for several years; other insects doing surprisingly little damage. Indian corn came forward rapidly with the warm weather of the month, and at its close was little below the normal. Much of the crop is used for the silo. The hay crop was somewhat below the average in quantity, but of excellent quality and secured in good condition. The acreage of forage crops was slightly increased, but needed rain at the close of the month. Market-garden crops were generally good, but not extra, with prices normal. No early potatoes were dug, but they generally promised well. Apples fell off in condition during the month. Pears and plums only light crops; peaches promised a good crop; quinces average; grapes and cranberries set well. Feed in pastures was in unusually good condition. Rye, oats and barley were good crops, both for grain and forage.

Indian corn advanced rapidly during August and at its close was nearly up to the normal. Only two correspondents reported that sweet corn was raised for canning, but it is grown extensively as a late forage crop. Rowen did not promise an average crop, owing to drought and late cutting of first crop. Late potatoes threatened to be considerably below the normal, blight and rot having appeared. There was a slight increase in the acreage of tobacco and an excellent crop. Pastures were in unusually good condition. Apples dropped badly, but were above the average for an off year; pears only a light crop; peaches promised an unusually heavy yield; grapes set well; cranberries suffered from winter-killing, spring frosts and insect damage, and only promised a light crop. Oats were a heavy crop, with barley good for forage and the silo.

Indian corn did not ripen as rapidly in September as had

been hoped and much remained unsecured. An excellent growth of stover was reported and a good growth of ears. The rains greatly improved rowen, but it still was somewhat below the normal, and much unsecured at the close of the month. Fall seeding was delayed by wet weather, but that put in was in fine condition. Onions were considerably under a normal crop, and were of small size. Potatoes closely approached a total failure, with light yield and much injury from rot and grubs. Root crops generally promised well. Celery was doing well, though not especially forward. Other late market-garden crops generally promised well. Apples deteriorated, and a light crop of poor quality is all that was promised; pears were a fair crop; peaches yielded well, but suffered severely from rains, while prices ruled low; grapes generally yielded well; cranberries only a light crop.

In the circular to correspondents returnable October 25 the following questions were asked:—

1. What is the value of the corn crop compared with a normal crop?
2. Have root crops proved to be average crops?
3. What is the condition of farm stock?
4. What is the condition of fall seeding?
5. How have prices for crops raised for market compared with former years?
6. Which of the leading crops in your locality do you think have been most profitable?
7. Which of the leading crops in your locality do you think have been least profitable?
8. Considered as a whole, has the season been a profitable one for your farmers?

Returns were received from 154 correspondents, from which the following summary has been made:—

VALUE OF THE CORN CROP.

Indian corn was backward throughout the season, and much of the crop would in ordinary years have suffered from frosts. However, the extraordinarily open fall, with no killing frosts in many sections until the morning of October

26, gave the crop ample opportunity to ripen. The result was a crop considerably above the normal in value of stover, and very nearly normal in value of grain. The warm, pleasant weather was very favorable for curing the stover, so that it is seldom that so much excellent roughage for stock has been secured from this crop as this year. Ensilage corn also made a fine growth, and was secured in good condition in all sections.

ROOT CROPS.

Root crops are generally reported to be good average crops, a few correspondents only reporting them as below, and have generally brought good prices where raised for market. Potatoes rotted badly, and the crop was almost a total failure for the State as a whole. Celery is a good crop, as are other late market-garden crops.

FARM STOCK.

Feed in pastures has been uniformly good throughout the season, and as a result farm stock is going to the barns in good flesh. The flow of milk is also reported to be unusually well maintained for this season. Fall feed in mowings will probably not be as good as usual, owing to the late cutting of much of the rowen crop; and, indeed, farmers would do well as a rule not to pasture their mowings, but to allow the grass to retain all its late growth as a protection for winter.

FALL SEEDING.

Less fall seeding than usual has been done, owing to the continued wet weather of the latter part of August and the first half of September, but that put in early is reported as being in remarkably fine condition. That done after the rains has made a good catch, but is not remarkably forward, owing to lack of rain subsequent to sowing.

PRICES.

Prices of crops raised for market range considerably higher, as a whole, than for the past few years, probably in large measure because of shortages in some of the principal crops, as apples, potatoes, cranberries and onions. Of 147 corre-

spondents answering this question, 6 speak of prices as lower than usual, 90 as average or about average, and 51 as higher than usual. Prices for dairy and poultry products range slightly above even the high levels reached in 1904.

MOST PROFITABLE CROPS.

Seventy-two correspondents, less than a majority, consider hay to have been among the most profitable crops; 54, corn; 20, apples; 15, potatoes; 9, sweet corn; 8, oats; 8, tomatoes; 7, cabbages; 6, onions; 6, tobacco; 5, milk; 3, cucumbers; 3, forage crops; 3, asparagus; 3, strawberries; 3, beans; 2, celery; 2, cranberries; 2, peaches; 1, buckwheat; 1, root crops; 1, barley; 1, millet; 1, peas; 1, squashes; 1, fruits and berries; 1, lettuce; 1, parsnips; 1, beets; 1, turnips; and 1, cauliflower.

LEAST PROFITABLE CROPS.

One hundred and fifteen correspondents, an unusually large number to unite on any one crop, report that potatoes are among the least profitable crops; 17, apples; 7, onions; 4, hay; 4, cabbages; 4, cranberries; 3, squashes; 2, oats; 2, pears; 2, beans; 2, turnips; 2, strawberries; 1, grapes; 1, tomatoes; 1, cauliflower; 1, lettuce; and 1, peas.

PROFITS OF THE SEASON.

The general trend of the reports would indicate that our farmers are generally well satisfied with the season now closing. In the main, good crops have been secured, and where shortages have occurred prices usually have ruled high. Market gardeners generally have had a profitable season, with good crops and average prices. Dairy men have received prices averaging a little better than formerly; milk and butter fat have been economically produced, by reason of good pasturage; and barns and silos are well filled in anticipation of winter. Poultry raisers have received good prices for their products. Apples have been as good a crop as could be expected, this being generally the non-bearing year, and have brought high prices. Peaches were

a very heavy crop, with correspondingly low prices. Other fruits and berries have given fair to good yields, and brought average prices. On the whole, our horticulturists should not complain. Of the 149 correspondents answering the question as to profits, 80 consider the season to have been a profitable one, 20 an average season for profit, 13 fairly profitable, while 6 think that it has been above the average for profit and 30 that it has not been a profitable one.

NOTES OF CORRESPONDENTS.

(Returned to us October 25.)

BERKSHIRE COUNTY.

Alford (LESTER T. OSBORNE). — The corn crop is rather above the normal in value. Root crops are average crops, except potatoes, which are about half a yield. Farm stock is in better than average condition, as pasturage has been extra good. Fall seeding is above the average in condition. Prices for crops raised for market about as in former years. Corn has been our most profitable crop, and hay and potatoes our least profitable ones. Considered as a whole, the season has been profitable, except where hay is the main reliance.

Stockbridge (F. A. PALMER). — Indian corn is somewhat above a normal crop in value. Root crops are up to the usual average. Farm stock is in fine condition, with plenty of good feed in pastures. Fall seeding is in extra good condition. Prices for crops raised for market have compared very favorably with former years. Corn and oats have been our most profitable crops, and potatoes our least profitable one, rotting badly. The season has been a profitable one, for though grass, our main crop, suffered from early drought, later rains have more than compensated for this loss.

Lee (A. BRADLEY). — Corn is a full average crop, both for grain and stover. Root crops are fully up to the usual average. Farm stock is in good condition. Prices for crops raised for market have been good. Hay has been our most profitable crop, and apples our least profitable one. Grass, including rowen, has been a full crop; tobacco 100; berries 100; apples a disappointment; potatoes nearly half rotted. Taking crops as a whole, farmers have no reason to complain.

Becket (WM. H. SNOW). — Corn is a full average crop. Root crops are up to the usual average. Farm stock is in very good condition. What little fall seeding has been done is in good condition. Prices have been up to former years, and if anything a little better. Corn, oats, hay and apples have been our most profitable crops, and potatoes our least profitable one, owing to rot. The season must have been a profitable one, as there has

been a good market for all crops grown. Hay was a light crop in some cases, but rowen has generally been better than usual.

Hinsdale (THOS. F. BARKER). — Indian corn is above the average in value. Root crops are fine, but little grown. Farm stock is in fair condition, and fall feed held out well, owing to plentiful rains. But little fall seeding has been done. Potatoes have brought higher prices than usual. Corn and oats have been our most profitable crops, and potatoes and garden crops our least profitable ones. Everything considered, the season has been a profitable one. A fine crop of rowen has been secured in this vicinity.

Dalton (WESLEY B. BARTON). — Corn is fully up to the normal in value. Farm stock is in good condition. Root crops are up to the usual average. Fall seeding is in fair condition. Prices for crops raised for market have been 15 per cent higher than usual. Hay has been our most profitable crop, and potatoes, except those sprayed, our least profitable one. I think the season has been a profitable one, considered as a whole.

Windsor (H. A. FORD). — Indian corn is a much better crop than the crops of the last two years. Root crops are average yields. Farm stock is in good condition. Fall seeding is in fine condition. Prices for crops raised for market have been about the same as usual. Potatoes are our most profitable crop, and oats our least profitable one. Considered as a whole, the season has been about an average one for profit.

Savoy (WILLIS W. BURNETT). — The corn crop is probably from two-thirds to three-fourths of the normal in value. Farm stock is in first-class condition. But little fall seeding has been done, but that is in fine condition. Prices of crops raised for market have been fully average. Hay has been our most profitable crop, and corn our least profitable one. The season has been an average one for profit.

Williamstown (S. A. HICKOX). — Frost has held off so well that a normal crop of Indian corn has matured. Root crops are not up to the usual average. Farm stock is in good condition, as is also fall seeding and pasturage. Prices for crops raised for market have compared well with former years. Grass has been our most profitable crop, and potatoes our least profitable one. Crops were late in maturing, but barns, silos and corn cribs are well filled, and the season has been a profitable one for our farmers.

FRANKLIN COUNTY.

Charlemont (J. M. J. LEGATE). — Indian corn is much below the average in value. Root crops have not proved to be average yields. Farm stock is in fine condition, as good as could be ex-

pected or asked for. Fall seeding was never in better condition. About the usual prices have been received for crops raised for market. Hay has been our most profitable crop, and potatoes our least profitable one. The season as a whole has been below the average for profit.

Colrain (A. A. SMITH). — The corn crop is a little above the normal in value. Root crops are generally up to the average. Farm stock is in good condition, and prices high. Fall seeding is nearly completed, and a good catch reported. Prices have been rather high for crops raised for market. Apples are our most profitable crop, and potatoes our least profitable one, owing to shortage due to rot. Farmers have had a very successful year, as all farm produce is high, and with the exception of potatoes good crops are reported.

Ashfield (CHAS. HOWES). — Corn matured well, and is a full average crop. Most root crops are fully up to the average. Farm stock is in good condition. Owing to wet weather, not as much seeding as usual has been done, but that which is in is in good condition. Crops raised for market are bringing full average prices. Apples have been our most profitable crop, and potatoes the nearest to a failure. Frost holding off so late has given crops a chance to mature that would otherwise have been failures. The season has been a full average one for profit.

Gill (F. F. STOUGHTON). — Indian corn is a good average crop. Farm stock is in good condition. Not much fall seeding has been done. Grass and corn have been our most profitable crops, and potatoes our least profitable ones. Pastures have been good; hay crop less than average, on account of May drought; potatoes, apples and grapes very light yields.

Sunderland (GEO. P. SMITH). — Corn is just about a normal crop. Root crops have yielded well, but are not grown to any extent. Farm stock is in good condition. Fall seeding looks well. Early prices for crops raised for market were above average, but are now lower. Onions and tobacco are our leading crops for profit. Farmers in this locality will have a balance in their favor for this season's work.

Wendell (N. D. PLUMB). — Indian corn is considerably above the normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking the best for years. Higher prices than usual prevail for nearly all products. Corn and oats have been our most profitable crops, and potatoes our least profitable one. Owing to higher prices for fruit and other products, the farm season has been above the average.

Erving (CHAS. F. CLARK). — Corn is an average crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been about the same as usual. Considered as a whole, the season has been a profitable one for our farmers.

Northfield (THOS. R. CALLENDER). — Indian corn is above average in condition, well eared, and stover prime. Root crops have proved to be average yields, with the exception of potatoes. Fall seeding is in fine condition. Prices for crops raised for market have compared very favorably with former years. Corn and cucumbers have been our most profitable crops, and potatoes our least profitable one. The season has been very profitable, the only marked failure being the potato crop, many fields hardly paying for digging.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — Indian corn is 10 per cent above the normal in value. Root crops have been good crops, with the exception of potatoes. Farm stock is better than average in condition. Fall seeding is in good condition. Most of our crops go to market in the form of cream, veal and pork, and prices for these have been fully up to the average. Corn and hay have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a fair one for profit.

Belchertown (H. C. WEST). — Corn is nearly up to the normal in value. Potatoes 40 per cent below the normal; turnips fair crop; beets, parsnips and carrots good. Farm stock is in very good condition. Fall seeding is fully up to the average. Prices for crops raised for market have been well up to former years. Corn has been our most profitable crop, and potatoes our least profitable one. The season is not up to the average for profit. The late summer and early fall rains, with fine weather, did much to bring forward and mature crops which promised to be nearly failures.

Amherst (WM. P. BROOKS). — Indian corn is a full average crop in value. Root crops have proved to be average crops. Farm stock is in excellent condition. Fall seeding was never in better condition. Prices for crops raised for market have been rather above the average. Tobacco, onions, potatoes and grass have been our most profitable crops, and corn our least profitable one, though even this will pay. I think the season has been a profitable one, though the outcome from the tobacco crop is still uncertain.

Hadley (H. C. RUSSELL). — The early part of the season was very unfavorable to the corn crop, but the mild fall weather has

brought it up to a full average. Root crops are average crops. The late rains have made good fall feed, and farm stock is in excellent condition. Fall seeding is in excellent condition. Potatoes have brought higher prices than usual, and onions lower. Tobacco has been our most profitable crop, and potatoes our least profitable one, owing to rot. There has not been a crop grown that did not have some out about it, — tobacco was hail-cut, potatoes rotted, onions are under-sized, apples are a short crop; and yet, on the whole, the season may be considered a fairly profitable one.

Southampton (C. B. LYMAN). — The corn crop is a fairly good one, though not as large as some years. Root crops are large yields, but have rotted badly. Farm stock is looking well. Fall seeding is in very good condition. Prices for crops raised for market have been fully average. Grass, tobacco and corn have been our most profitable crops, and apples and potatoes our least profitable ones.

Huntington (H. W. STICKNEY). — Indian corn is not quite up to the average in value. Root crops are full average yields. Farm stock is not as good as usual in condition. Fall seeding is fully up to the average. Prices for crops raised for market are good, and potatoes are worth more than usual. Corn has been our most profitable crop, and potatoes our least profitable one. The best quality of hay is worth \$15 per ton at the barn, and has brought \$20 per ton in Holyoke.

Chesterfield (HORATIO BISBEE). — The corn crop is extra good in growth, and has matured well, say 10 per cent above the normal. Root crops are average yields. Farm stock is in good condition. Fall seeding is extra good. Corn has been our most profitable crop, and potatoes our least profitable one, having rotted badly before and after digging. We have quite a few apples, and the crop is worth more than last year's large one. Dairy products have been in good demand, and at good prices. The year has been a profitable one.

Goshen (ALVAN BARRUS). — Some fields of Indian corn were late about maturing, some extra; on the whole, normal. All root crops were average, except potatoes, which decayed badly. Fall seeding looks well. Prices for crops raised for market have been good. Hay has been our most profitable crop, and potatoes our least profitable one. Scarcity of labor, general poor quality and exceptionally high prices thereof have eaten largely into the farmers' profits.

HAMPDEN COUNTY.

Blandford (ENOS W. BOISE). — The warm fall has caused corn to mature well, even in the shock. Root crops have proved extra good. Farm stock, on account of much trouble from horn flies during the summer and fall, is hardly up to the normal in flesh. A small amount of fall seeding has been done, and is in first-class condition. All crops have commanded full average prices. Grass has been our most profitable crop, with apples a close second, and potatoes our least profitable one, mainly because of rot. All things considered, the season has been fully up to the average for profit.

Russell (E. D. PARKS). — Indian corn is above the average as to yield and fodder. Root crops are about average. Farm stock is in fair condition. Fall seeding is in very good condition. Prices for crops raised for market have been about the same as usual. Hay, corn and potatoes have been our most profitable crops, and apples and oats our least profitable ones. The year has been a fair one, taken as a whole. Butter and eggs have brought higher prices than usual, and helped out the crops.

West Springfield (T. A. ROGERS). — Indian corn is fully up to the normal in yield and value. Root crops have grown slowly, and are below average yields. Farm stock is in average condition. Fall seeding is looking finely. There is not much change in prices for crops raised for market. Hay, corn and celery have been our most profitable crops, and onions and potatoes our least profitable ones. The season has hardly been a profitable one. The weather conditions have been very peculiar, — spring cold and dry, part of summer hot and wet, — so that crops have grown by jumps and matured the same way.

Agawam (J. G. BURT). — Corn is about a normal crop for value. All root crops have given average yields except potatoes. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market are about the same as usual. Hay and corn have been our most profitable crops, and potatoes our least profitable ones. Considered as a whole, the season has been an average one for profit.

Ludlow (CHAS. B. BENNETT). — Indian corn is about two-thirds of a normal crop in value. Root crops are up to the usual average. Farm stock is in fair condition. Fall seeding is in very good condition. Prices for crops raised for market have been about average. Potatoes have been our most profitable crop, where they have not rotted, and hay our least profitable one, as the crop is very light this year. The apple crop is the lightest

for years, — scarcely any hand-picked apples. There is a fair acreage of rye sown, which looks very well.

Hampden (JOHN N. ISHAM). — The corn crop is the best for years. Root crops have been good, except potatoes, which rotted badly. Farm stock is in excellent condition. Prices for crops raised for market have generally been equal to former years. Corn and hay have been our most profitable crops, and apples our least profitable one, while on some farms potatoes have also been a very light crop. Farmers have little to complain of, as all crops have been fairly good, and prices have been such as to return a fair profit. Frosts have held off so that everything has matured.

Brimfield (C. S. TARBELL). — Indian corn is rather better than an average crop. Root crops are up to the usual average. Farm stock is in fair condition, but not extra good. Fall seeding is in good condition. Corn is probably our most profitable crop, and potatoes our least profitable one, on account of the great amount of rot. Considered as a whole, the season has been a fairly profitable one for our farmers.

Holland (FRANCIS WIGHT). — Indian corn is very near to a normal crop. Root crops are fully up to the average in yield. Farm stock is in fairly good condition. Fall seeding is coming up well. Prices for crops raised for market have been higher than usual, if anything. Corn has been our most profitable crop, and apples our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

WORCESTER COUNTY.

Charlton (WM. GILBERT). — Corn is a little above the normal in value. Root crops are up to the usual average. Farm stock is looking well. Fall seeding is in good condition. Prices for crops raised for market are fully up to the average. Potatoes and sweet corn are our most profitable crops, and cabbages our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

Leicester (H. H. KINGSBURY). — The corn crop is equal in value to a normal crop. Potatoes not over half a crop, owing to rot; other root crops good. Farm stock is in fine condition, there having been an abundance of feed. Fall seeding has been very good, owing to favorable weather. Prices for crops raised for market have been a shade lower than usual. Hay is our most profitable crop, and potatoes our least profitable one. The season does not differ much in results from the normal.

North Brookfield (JOHN H. LANE). — Indian corn is a full normal crop. Root crops are up to the usual average. Farm stock is in splendid condition. Prices for farm crops are the same as usual, except for potatoes, which are 50 per cent higher. Grass, which means milk and veal, is our most profitable crop, and potatoes our least profitable one with most. Considered as a whole, the season has been a profitable one. The growth of corn fodder was immense, the silos not holding over three-fourths of it, which will make up for a slight shortage in hay.

Oakham (JESSE ALLEN). — The corn crop is a full average one for value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding looks well. Prices for crops raised for market have been a trifle higher than usual. Milk and apples have been our most profitable products, and potatoes our least profitable one, having rotten badly. Considered as a whole, the season has been a profitable one for our farmers.

Petersham (D. F. BIGELOW). — Indian corn is about a normal crop. Root crops have proved to be good average yields. Farm stock is in extra good condition. Fall seeding is in good condition. Apples have brought higher prices than usual, potatoes about the same. Apples have been our most profitable crop, and potatoes our least profitable one. The season has been a profitable one, we getting at least a living from the farm.

Royalston (C. A. STIMSON). — Indian corn is almost a full normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been fully up to former years. Corn has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

Gardner (A. F. JOHNSON). — The corn crop is fully up to the normal in value. Root crops are good average crops. Farm stock is in good condition. Fall seeding is in good condition. There has been no change in the prices received for farm crops. Milk has been our most profitable product, and apples our least profitable one. There are no profitable years for farmers.

Westminster (ALDEN J. FOSKETT). — The corn crop is fully up to the normal in value. Root crops are just about average yields. Farm stock is in good condition. Fall seeding is in A1 condition. About the usual prices have prevailed for farm crops, apples a little higher than usual. Hay has been our most profitable crop, and potatoes our least profitable one, owing to rot. The season has been a profitable one for our farmers.

Princeton (A. O. TYLER). — Indian corn is about three-fourths

of a normal crop. Root crops are up to the usual average. Farm stock is looking well. Fall seeding was late, and there is nothing to say in regard to its condition. Prices for crops raised for market have been about average. Milk has been our most profitable product, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one for our farmers.

Holden (CHAS. E. PARKER). — Indian corn is 10 per cent above the normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking well. Prices for farm crops have been much better than last year. Apples have been our most profitable crop, and potatoes our least profitable one, having mostly rotted. The season has been a profitable one, fruit having sold well, also garden crops. There has been a remarkably fine fall, the first frost October 21.

Worcester (SILAS A. BURGESS). — Corn is about 10 per cent below the normal in value. Root crops are not up to the normal by 20 per cent. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been 25 per cent higher than last year. Hay and forage crops have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one for our farmers. Cold, dry weather in spring prevented an extra hay crop.

Northborough (JOHN K. MILLS). — The corn crop is worth 25 per cent more than that of last year. Root crops have proved to be full average crops. Farm stock is looking well, and will come to the barn in good condition. Fall seeding is growing finely. Prices for crops raised for market are about the same as in former years. Corn, asparagus, strawberries, tomatoes, apples, onions, hay and root crops have been our most profitable crops, and grapes, pears, potatoes, squashes and cabbages our least profitable ones. As a whole, the season has been fairly profitable for all active, industrious farmers.

Southborough (E. F. COLLINS). — Corn for ensilage was an excellent crop. Flat and egg turnips have done well. Farm stock is in good condition, as feed has averaged good. Fall seeding is in excellent condition. All kinds of farm crops have brought good prices. Sweet corn, apples and tomatoes have been our most profitable crops, and squashes, beans and potatoes our least profitable ones. Farming is more profitable than several years ago, especially for farmers that employ little or no help.

Sutton (CHARLES P. KING). — Indian corn is above the average crop in value. Root crops have proved to be average yields. Farm stock is in good condition. Fall seeding is in good condition.

Prices for crops raised for market have been better than usual. Hay, oats and corn have been our most profitable crops, and potatoes our least profitable one, owing to rot. Considered as a whole, the season has been a profitable one. Never has good farm help been as hard to get as now.

Mendon (J. J. NUTTER). — Indian corn is fully up to the average. Root crops are not much grown, but are about average yields. Farm stock is in fully as good condition as common. Fall seeding is in very good condition. Prices for crops raised for market have been fully up to the average. Hay has been our most profitable crop, and potatoes our least profitable one. As the potato and apple crops have been poor, the season has not been an average one for profit.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Indian corn hereabouts is a normal crop. Root crops are not as good as usual. Farm stock is in very good condition. Fall seeding is in good condition hereabouts. Prices for crops raised for market are about the same as usual, potatoes a little higher. Ensilage corn and potatoes, when not affected by rot, have been our most profitable crops; and hay and potatoes, where affected by rot, our least profitable ones. Crops took longer than usual to mature, owing to cool nights, but the warm fall ripened them well; no frost to do damage up to the 24th. The season has been a profitable one.

Framingham (J. S. WILLIAMS). — Corn has been a good crop in value, fully up to the normal. Root crops have made good growth, with satisfactory results. Stock is looking well, showing that pasturage has been good. Fall seeding is unusually fine, with a good, even catch. Good prices have prevailed for market crops. Grass and corn have been our most profitable crops, and potatoes our least profitable one, owing to blight and rot. With hard work and close application the season has been a profitable one.

Marlborough (E. D. HOWE). — Indian corn is a good normal crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been rather better than usual. Peaches and apples have been our most profitable crops, and potatoes our least profitable one, as they rotted badly. Considered as a whole, the season has been more profitable than any for the last five years.

Littleton (GEO. W. SANDERSON). — The corn crop is above the average in value. Root crops are up to the usual average, with

the exception of potatoes. Farm stock is in good condition. The weather since September 20th has been favorable for fall seeding, and much has been done. Market crops have made quick sales and brought good prices. Hay and forage crops are our most profitable crops, and potatoes and apples our least profitable ones. Considered as a whole, the season has been a profitable one for our farmers.

Townsend (G. A. WILDER). — Corn is about normal in value of crop. Root crops have proved to be average yields. Farm stock is in good condition. Fall seeding is in normal condition. Prices for crops raised for market have ruled about the same as usual. Peaches and apples have been our most profitable crops, and potatoes our least profitable one, as they are rotting badly. Considered as a whole, the season has been a profitable one for our farmers.

Pepperell (W. F. DENNEN). — Indian corn is a good crop, a little above the normal in value. Root crops are about average yields. Farm stock is in very good condition as a whole. Fall seeding is in quite good condition. Prices for crops raised for market have been fully as high as for a few years past. Apples and hay have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been quite a profitable one.

Chelmsford (P. P. PERHAM). — The corn crop is a good average in quantity and quality. Root crops are more than average. Farm stock coming in from the outlying pastures is in fine condition. Fall seeding is in fine condition. Crops raised for market are abundant, but prices are low. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one, partly owing to the abundant apple crop in this vicinity.

Lincoln (C. S. WHEELER). — Indian corn is little raised, but is fully up to the normal in value. Root crops are giving average yields. Farm stock is in excellent condition. Fall seeding is in fair condition. Prices are generally higher than average for market crops. Sweet corn, cucumbers, tomatoes, strawberries and pole beans have been our most profitable crops, and cauliflower our least profitable one. The past season has been more than an average one for profit.

Wakefield (CHARLES TALBOT). — Indian corn is fully up to last year in value. Root crops are slightly better than usual. Farm stock is in very fair condition. Fall seeding was never in better condition. Prices for crops grown for sale are fully 20 per cent higher than last year. Cabbages and onions have been our most profitable crops, and potatoes our least profitable one. All

farmers seem well satisfied with the season; have heard but two speak otherwise.

Arlington (W. W. RAWSON). — Root crops are very light. Prices for crops raised for market have ruled low. None of our leading crops have been particularly profitable. Considered as a whole, the season has not been a profitable one for our farmers.

Newton (G. L. MARCY). — Sweet corn is the only variety grown, and it has been about normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been higher than usual. Forage crops, tomatoes and sweet corn have been our most profitable crops, and potatoes our least profitable one. I should say the season had been a little above the average for profit.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Indian corn is about 20 to 25 per cent over a normal crop in value. Potatoes are a little below average, other root crops up to the average. Farm stock is looking well, and will come to the barn in good condition. Fall seeding is in good condition. Prices for most crops are better than in former years, and much better than last year. Apples and hay are our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. Cabbages are looking well, but squashes are not a large crop.

Haverhill (EBEN WEBSTER). — Corn is fully as good a crop as usual. Root crops are up to the usual average. Farm stock is looking well. Fall seeding is in fair condition. Prices for crops raised for market are better than usual. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a fairly profitable one.

Andover (MILO H. GOULD). — Indian corn is less valuable as a crop than usual. Root crops are up to the usual average. Cattle are coming from the pasture thin in flesh. Fall seeding is in good condition. Prices for crops raised for market have been above the average. Cucumbers for pickles have been our most profitable crop, and potatoes and strawberries our least profitable ones. The season has been a profitable one, prices having been good and demand also.

Topsfield (B. P. PIKE). — Very little corn is raised except sweet corn for market and southern corn for silo. Root crops are average yields. Farm stock is in good condition. Early seeded fields look well, but it has been too dry for late seeding. Milk and hay have been our most profitable products, and potatoes our least

profitable one. Considered as a whole, the season will be a profitable one for our farmers.

Wenham (N. P. PERKINS). — Not much corn is raised here, but it is hardly up to a normal crop. Root crops are good average crops. As a rule, farm stock is looking well. Fall seeding is rather slow in starting, but where well manured has come up even and promises well. Prices for crops raised for sale vary somewhat, but on the whole are probably about average. Early cabbage, sweet corn, parsnips and beets are our most profitable crops, and squashes, onions, peas, apples and potatoes our least profitable ones. If the winter market should be good, with good prices, the season would have been fairly profitable.

Danvers (C. H. PRESTON). — Indian corn is an average crop in value. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been average or better. Considered as a whole, the season has been a profitable one for our farmers.

NORFOLK COUNTY.

Stoughton (CHARLES F. CURTIS). — The corn crop was only about two-thirds of the value of an average crop. Root crops are about 20 per cent short. Farm stock is in the best of condition. Fall seeding is doing well. Prices for crops raised for market are higher than usual. Hay has been our most profitable crop, and potatoes our least profitable one. The season has not been a profitable one in this town, owing to lack of rain.

Canton (EDWIN V. KINSLEY). — Indian corn is a fair average crop. Root crops are not quite average yields. Farm stock is in very good condition. Fall seeding is in very good condition. Prices for crops raised for sale have ranged above the average. Cabbage and sweet corn have been our most profitable crops, and potatoes and onions our least profitable ones. Considered as a whole, the season has been a profitable one for our farmers. The latter half of the season has been quite favorable for the growth of many crops, including forage crops, and herds are still being fed in part or wholly on green feed, keeping the cows in full flow of milk.

Walpole (EDWARD L. SHEPARD). — Indian corn is 75 per cent of a full crop in value. Root crops are not up to the usual average. Farm stock is in fairly good condition. Fall seeding is not in very good condition. Prices for crops raised for market have been higher than usual. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has decidedly not been a profitable one.

Millis (E. F. RICHARDSON). — Indian corn is better than an average crop. Root crops have proved to be good yields. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market are better than average. Corn and grass have been our most profitable crops, and potatoes our least profitable. Potatoes gave promise of a good crop, but the rot took about half the crop. Considered as a whole, the season has been a profitable one.

Franklin (C. M. ALLEN). — Corn is 90 per cent of a full crop in value. Root crops are up to the usual average. Feed has been good and farm stock is in fine condition. Fall seeding looks very nicely. Prices for crops have been high, also the cost of raising them. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one; help has been so high, poor and unreliable that the profits have gone to the other party.

BRISTOL COUNTY.

Attleborough (ISAAC ALGER). — Indian corn is a full average crop for value. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market are about the same as usual. Corn has been the most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has not been a very profitable one.

Norton (WILLIAM A. LANE). — Corn is about an average crop. Root crops have been up to the usual average. Farm stock is in good condition. Fall seeding is looking well. Prices for crops raised for sale have not been as good as last year. Potatoes and grass have been our most profitable crops. Considered as a whole, the year has been a fair one for farmers.

Dighton (JAMES N. PAUL). — Indian corn is a full crop in value. Root crops have proved to be average yields. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been about normal. Potatoes have been our most profitable crop, and strawberries our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

Swansea (F. G. ARNOLD). — The corn crop is a little below the average in value. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is looking well. Prices for crops raised for market are a little above the usual average. Potatoes have been the least profitable of any of our leading crops. Considered as a whole, the season has been about an average one for profit.

Westport (ALSBERT S. SHERMAN). — Indian corn is 25 per cent better than an average crop. Root crops are scarcely average; blight injured turnips very badly. Farm stock is in good condition and promises to winter well. Fall seeding has taken well, and looks nicely. Prices for farm crops about as usual, except potatoes, which are low. Corn is our most profitable crop, and potatoes our least profitable one, as they rotted badly. The season has been a profitable one, crops and prices generally being fair. Milk production is our principal industry, and good milk always finds a ready sale.

Acushnet (M. S. DOUGLAS). — Corn is 25 per cent above the normal in yield and value. Root crops have been average yields. Farm stock is in good condition, with plenty of fall feed. Fall seeding was done late this year, and has not made good progress. Prices for crops raised for market have been good, except for potatoes. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. We had no early frosts to hurt vegetation.

PLYMOUTH COUNTY.

Hingham (AARON LOW). — Indian corn has not grown as well as usual. Root crops have proved to be average crops. Farm stock is in excellent condition, pastures having been good. Fall seeding is first class. Farm crops have sold at low average prices. Cabbages have been our most profitable crop, and potatoes our least profitable one. The season has not been a profitable one, owing to low prices for crops, and high price and poor quality of labor.

Norwell (HENRY A. TURNER). — Indian corn is a good average crop. Root crops are good, with the exception of potatoes. Farm stock is in good condition. Fall seeding is very good. Prices for crops raised for market have been about the same as usual. Cauliflower and hay have been our most profitable crops, and apples and potatoes our least profitable ones. We have had a good season.

West Bridgewater (CLINTON P. HOWARD). — Corn is the best crop for years, and above the normal in value. Root crops are average yields. Late pasturage has been good, and pastures are looking finely. Fall seeding is in very good condition. Hay and pasture first, and potatoes second, have been our most profitable crops. If the average farmer can make his own time worth as much as he has to pay all day help hired, the season will be a profitable one.

Hanson (FLAVEL S. THOMAS, M.D.). — Indian corn is about an average crop. Root crops have not been up to the normal. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been rather better than usual. Cranberries have been our most profitable crop. There are but few apples, and those of poor quality. The season has been a very poor one, more failures than successes, due to frosts, drought, insects, etc.

Halifax (G. W. HAYWARD). — We have an excellent corn crop, of full average value. Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding sown in August or the first of September never looked better. Prices for crops raised for market have been about the same as for a number of years. Hay has been our best crop, and the most profitable, with potatoes our least profitable one. The season has been very uneven, some farmers securing good crops, and others not getting enough to pay for the fertilizer used.

Plympton (WINTHROP FILLEBROWN). — The corn crop was much better this year than usual. Root crops have been about average. Farm stock is in excellent condition. Fall seeding is not up to the standard. Prices for crops raised for market range about as usual. Hay is really our most profitable crop, and potatoes our least profitable one, as they rotted badly and were injured by grubs. The season as a whole has been profitable, and our farmers seem encouraged.

Mattapoisett (E. C. STETSON). — Indian corn is quite a little better than an average crop. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for sale have been about average. Corn has been our most profitable crop, and onions our least profitable one. Considered as a whole, the season has been a profitable one.

BARNSTABLE COUNTY.

Bourne (D. D. NYE). — Indian corn is about a normal crop in value. As a general thing, root crops have done well. Farm stock is looking remarkably well. Fall seeding is in very good condition. Prices for crops raised for market have compared favorably with other years. Hay and potatoes have been our most profitable crop, and cranberries our least profitable one. Some crops have been profitable, and where the farmer had a variety, he has on the whole had an average season for profit.

Mashpee (W. F. HAMMOND). — The corn crop is an average one. Root crops have proved to be average yields. Farm stock

is in good condition to begin the winter. Fall seeding is looking well. Prices for market crops have been about average. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one. After the heavy rains of September potatoes began to rot, and many have not dug them at all.

Barnstable (JOHN BURSLEY). — Indian corn is 80 per cent of a normal crop in value. All root crops except turnips have given average yields, they being small and late. Farm stock is in good condition. Fall seeding is in fine shape. Prices for crops raised for market have been slightly higher than usual. Apples have brought good prices, and have been most profitable where they have yielded fairly well. Because of the very small crop of cranberries, returns have not been what owners expected. The season has been fairly profitable. Receipts from poultry have probably been the most satisfactory of those from our side lines.

Brewster (THOS. D. SEARS). — There is about a normal corn crop. Root crops are rather above the average. Farm stock is looking very well. Fall seeding is quite good. Prices for crops raised for market have been about the same as in former years. Potatoes have been our most profitable crop and cranberries our least profitable one. Taken altogether, the season has been a fairly profitable one for our farmers.

Harwich (AMBROSE N. DOANE). — Indian corn is very much better than a normal crop. Root crops are up to the usual average. Farm stock is in fair condition. Not much fall seeding has been done. Prices have been much better for farm crops than usual. Corn, potatoes and hay have been our most profitable crop, and cranberries, our leading crop, our least profitable one. The season has not been as good as an average one.

Wellfleet (EVERETT S. JACOBS). — Root crops are above the average. Farm stock is in good condition. Very little fall seeding is done here, but that put in is promising. Better prices for market crops than usual have ruled throughout the season. Peas, beans, sweet corn and tomatoes have been our most profitable crop, and potatoes our least profitable one, owing to rot. Considered as a whole, the season has been a profitable one.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). The corn crop is an average one for value. Root crops are below average in yield. Farm stock is in very good condition. Average prices have been re-

ceived for crops raised for market. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a fairly profitable one.

NANTUCKET COUNTY.

Nantucket (H. G. WORTH). — Indian corn is about 80 per cent of a full crop. Root crops are below the usual average. Farm stock is in good condition. No fall seeding is done here. Prices have been about normal for crops raised for market. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season is not up to the average for profit.

BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

CLEAN MILK: SUGGESTIONS FOR THE AVERAGE PRODUCER.

By P. M. HARWOOD, *General Agent, State Dairy Bureau.*

Milk has been truly termed "the world's first food." The importance of a pure, clean article can hardly be overestimated. The health, happiness, vigor and prosperity of a people are in no small degree dependent upon the food consumed, and especially is this true of the food of children, who are later to become the men and women of the nation.

As secreted from the udder of the healthy animal milk is in perfect condition. In the case of cow's milk, the calf roaming in clean pasture with its mother has a monopoly on the perfect article. The troubles which come to milk most frequently come from without, and are attendant upon artificial conditions. These conditions begin with the housing of the animals and do not end until the product is finally consumed as food. Added to this is the present artificial method of rearing babies on cows' milk.

The changes which take place in milk are usually caused by the presence and development of certain micro-organisms, vegetable in their nature, known as bacteria, for example, the lactic bacteria which cause souring. Milk also serves as a medium for the conveyance of other forms, known as pathogenic bacteria, all of which do not multiply in the milk but produce diseases, such as tuberculosis, typhoid fever, scarlet fever, etc.

The bacteria which cause changes in the milk itself multiply with great rapidity after the milk is a few hours old, at certain temperatures. For instance, the bacteria which cause ordinary souring multiply most rapidly at about 70 degrees F. to 80 degrees F., and still others, though more slowly, at about 50 degrees F. The latter are, perhaps, most to be dreaded, as they are supposed to be the ones responsible for certain forms of toxic poisoning.

Bacteria get into milk by riding on dirt or any foreign substance, therefore the simple way to keep milk bacteria free is to keep it *clean*. This, however, is not entirely possible, but it is possible to reduce con-

tamination to the lowest terms, and then by reduction of temperature place the few bacteria present under conditions where multiplication becomes impossible, —40 degrees F. or below. Then by holding the milk at that temperature, and by keeping it sealed until ready to use, man's duty to himself and his fellows has been done, so far as this milk is concerned. Milk or cream thus handled will keep perfectly as long as needed.

Milk cannot be in perfect condition if the cows are diseased, or if the cows, milk utensils and milk room are handled or the milk distributed by one who has the care of sick persons or is sick or convalescent from contagious disease himself. Neither can it be in perfect condition if the milkers are not cleanly in their habits, milking, always, with clean, dry hands; or if food or bedding is shaken so as to fill the air of the stable with dust at or near the time of milking; or if the flanks and udder of the cow are not clean and damp enough to prevent any material from loosening during the process of milking and falling into the pail. Extra precaution may be taken by drawing a few streams of the first milk into the gutter, thus cleaning the inside of the teat of the stabled cow and at the same time making sure that there is no udder trouble, garget or bloody milk in any of the quarters; also by milking through a pad of sterilized cotton, though the milk can be strained through such a pad at a later stage, if the producer so prefers. The great advantage of milking through the pad is that the milk is sealed as soon as drawn, and is thus secured from contamination of any sort that might by any chance whatever be present in the stable. The milk when drawn must be removed at once from the stable to the milk room, which should be well lighted, sweet and clean, and so arranged that flies can be kept out. The utensils in this room must be sterilized each time before using,—steam or hot water and sunlight will do this. Most producers find that an aerator is a good thing to aid in quick cooling and for removing any taint in milk that may be present through food or otherwise. Once cooled below 40 degrees F. the milk vessels should be sealed and the milk kept unexposed until time for use.

I have thus far stated as concisely as I can the essentials for the production of clean milk. Of course, the healthy cow involves good food, pure water, well-ventilated stables and general sanitary surroundings, and the permanency or success of the business of milk production involves convenience of arrangement and constant vigilance. These do not necessarily involve expensive outlays in cash, though it is admitted that there is a severe demand upon energy and often a change of old time routine and habits. If the head of the establishment is all right in his ideas and habits, and puts his energy and personality into his business, the result may be far in advance of that attained by the idealist, who depends more largely upon his money and entirely upon his hired help.

The bulk of the milk consumed in our markets at the present time is made by the so-called average farmer,—a man of limited means and dependent upon the success of his business for his living. To him the various demands which are from time to time coming up mean much.

As the world advances in knowledge first comes one thing and then another, until, at times, he feels discouraged. He cannot afford mistakes, he cannot afford unnecessary outlays. But the public must be protected, and it is the farmer's duty to study the short road to the accomplishment of this by first adopting the essentials and afterwards adding the embellishments, as his trade demands and his means will allow. But be it ever remembered that the production of clean milk is in itself *not a prohibitively expensive operation*. It is the purpose of this article to encourage and if possible help the average dairyman, believing that the persistent producer of unsanitary milk must of necessity ultimately drop out of the business, and that the fancy farmer, so-called, can take care of himself.

In order to appreciate the present situation in which the average milk producer, *i. e.*, the man who sells his milk to contractors and peddlers, finds himself, let us briefly review the evolution of the milk business. Fifty years ago the New England farmer did everything at home and got all there was in the business up to the point of selling his product, then mainly cheese or butter, to the local storekeeper or country merchant, and those farmers near cities and towns selling milk either direct to the consumer or sometimes to the peddler. In the sixties, cheese factories sprang up, taking the burden of cheese making from the farmhouse, thus relieving the farmer, and especially the farmer's wife, of much hard work. Up to this time the farmer was not only the manufacturer of his own cheese and butter but also raised all his grain, and made a large amount of pork by keeping hogs fed upon the by-products, whey and skim milk. This establishment of cheese factories was the first step towards concentration in dairying in the districts now covered by the milk contractors. The seventies saw the introduction of creameries, the cheese business being driven to the west. At this time the Boston milk contractors began to reach out 60 or more miles for their supply. The creameries, therefore, within that radius, except in a few isolated instances, were short lived, and one by one they are dropping out, all over the State, New York city drawing milk from western Berkshire, and Boston from the rest of the State, aside from the local consumption by our growing cities and towns.

The business of the Massachusetts dairyman has undergone a wonderful change,—a change as complete in its way as the business of shoe making, in its transformation from the isolated cobbler in his little house at the cross roads to the great factories in Lynn, Brockton and elsewhere. Dairying has followed the trend of every industry, *viz.*, towards concentration and specialization. On the farms where once flourished the cheese making, the butter making, the swine fattening, beef fattening and the slaughterhouse, where also the wheat for the family and the grain for the animals were raised, and the flour bolted and the grain ground at the near-by grist mill, and where the great manure piles were the result of feeding the by-products, all have given place to the modern milk producer, who spends his energies in raising grass and clover for hay and corn for silage, green crops for summer feed, and the milk goes to Boston or elsewhere at the very lowest price

the contractors or peddlers can buy it for. The farmer no longer husks his corn or threshes his grain; everything grown is used as coarse fodder. He buys his grain and concentrated feeds, which indirectly helps to keep up the fertility of his farm. He has given up some of his laborious tasks; he has been forced to this, but it is a luxury that has to be paid for. This taking of milk, preparing it for market, mixing and pasteurizing, cooling and rebottling, delivering to peddlers, collecting bills, keeping it up to the standard, paying fines, keeping it cold and the bacteria reduced to board of health regulations, etc., all cost money.

For the last few years the straight price paid by milk contractors in the fifth zone has been $28\frac{1}{2}$ cents in winter and $26\frac{1}{2}$ in summer, amounting to an average of $27\frac{1}{2}$ cents, for the milk delivered at the railroad station, which is approximately the price which the average milk producers receive. This is considerably less than half, a little more than one-third, for 8-quart cans which really hold $8\frac{1}{2}$ quarts, the railroads, milk contractors and retailers getting all there is between that and the retail price, the price which the consumer has to pay for the milk in Boston. It is undoubtedly true that the milk contractors can transact their part of the business far more cheaply and more successfully than any one else. But there is one thing which they cannot do, and that is, change milk, by any process whatever, so that it will be better than or as good as "just as the cow secretes it." And in the matter of keeping the milk *practically in this condition* the farmer holds, right in his own hands, if he will, a monopoly which nobody can take from him. The public is fast becoming educated to the fact that this is the only *right milk*. This fact once established, such milk will command generally a higher price at retail, and milk that has, by whatever cause, ever been in such condition that it *needs* pasteurizing, sterilizing, rectifying, or any other doctoring, must, notwithstanding the additional cost thereby involved, bring a less price. The result would seem to be that farmers producing such milk must ultimately be recompensed for their efforts.

Furthermore, if the milk produced for the Boston market could be delivered at the stations in condition such as to do away with pasteurizing, rectifying, etc., it should so reduce the expense of handling that a better allowance could be meted out to the farmers by the contractors. An improved product also means greater consumption, hence increased market. The consumer should be willing to pay a fair price for clean milk. A rise of 1 cent per quart per day means \$3.65 per year, or \$1.21 per person on the basis of two-thirds of a pint, the milk consumption per capita in the large cities, as reported last year by the United States Department of Agriculture, or \$6 per year for a family of five persons. What head of a family would not give \$6 per year to insure milk made under sanitary conditions? It might mean a yearly sacrifice of 60 10-cent cigars, or 40 15-cent drinks of whiskey, or even 120 glasses of beer, or some other six-dollar sacrifice, but the saving of doctor's bills and increased health of children ought to be a sufficient reward.

About the year 1814 distilleries were started in the United States, and with them came the disposition of the by-product "slop" by feeding it

to cows huddled together in close unsanitary stables, usually in or near the large cities. The result of this was a quality of milk which wrought havoc among the consumers. The mortality among children under five years of age in the cities of New York and Philadelphia in 1814 was around 25 per cent., and in Boston was around 30 per cent. of the total deaths. As the distillery business developed, by 1840, among children of like age in New York and Philadelphia the mortality had reached over 50 per cent. of the total deaths, and in Boston was over 40 per cent. These figures were held with more or less variation for a number of years. The report of the board of health of the city of Boston for 1904 shows the gradual improvement during the last thirty years in the care and feeding of children in that city by the following mortality figures: 1875, 43.84 per cent.; 1880, 39.26 per cent.; 1885, 36.03 per cent.; 1890, 32.89 per cent.; 1895, 34.73 per cent.; 1900, 32.13 per cent.; and 1904, 28.87 per cent. New York and Philadelphia show similar improvement.

There can be no doubt but that this change for the better, shown by these statistics, is in no small degree due to the improvement of the farm conditions and the wisdom of our laws and health regulations, and the educational efforts which have been put forth by interested persons.

When the regulation of the evils ensuing on the feeding of distillery slop to dairy cows, and the inhumane and unsanitary housing and care of such cows, and the mortality of the young children was from 40 to 50 per cent. of total deaths, the conditions were much worse than now. Indeed, at no period in our history for the past hundred years has the death rate of children under five years of age in the city of Boston been so small as it is at the present time, and never before during all that time has the milk been delivered in our cities in such good condition as it is to-day. Never before could buyers feel the assurance that they were getting so good, pure and clean an article of milk or cream.

As another illustration of the fact that things are not as bad as they are sometimes painted, last winter one of our most up-to-date milk contractors had the milk from the entire number of farmers, 119, furnishing him milk from a single town, examined for bacteria, and found that only $2\frac{1}{2}$ per cent. were outside the Boston requirements and 83 per cent. were below one-tenth of these same requirements. This may be taken as a fair illustration of things as found in a community of intelligent milk producers.

Scare heads and sensational articles in the papers relating to the finding of filthy conditions in isolated dairies, thus magnifying the condition as a whole to make it appear inversely to what it is, are to be deplored, especially in so far as they frighten people against the use of milk. Milk is of such immense value as food, and is so cheap as compared with the same amount of nutriment in other forms, that its use should be encouraged as much as possible. But good as present conditions are, we want better.

I like to encourage the average milk producer, — he of all men has my sympathy. For years I was one myself. I am not going to decry a separate stable for the cattle, or the wing attachment to the hay barn,

the modern idea. These are all right if properly constructed and the owner can afford them. But the man with the stable in the first floor of the hay barn, with a cellar underneath, thus combining under one roof, saving expense and labor, need not "give up the ghost" as far as the production of clean milk is concerned. If he will keep effluvia reduced to lowest terms and out of the stable, and dirt out of milk by adopting the best known methods of milking, and take his milk at once from the stable upon drawing, remembering that whether his milk is clean or not depends upon him and not upon his wealth or costly buildings or upon extravagances or luxuries of any kind, he will meet with success. It is a great mistake to copy after wealthy fancy farmers any costly or *unnecessary* device. Many a man has kept himself poor by so doing. As an illustration of what can be done by confining oneself to essentials, I cite the following instance.

There is in this State a barn that accommodates some 30 head of cattle, costing not over \$1,250 above the foundation, constructed with the utmost care as to economy and utilizing to the very best advantage every foot of space, one roof covering hay, carriage room and stable, horses and cows kept together in a stable always warm, never too cold in winter or too hot in summer, never damp, always sweet, even though hogs run upon the manure in the barn cellar. The walls of this stable are double and provided with the King system of ventilation, thus insuring good air and at the same time warmth. The room is exposed on three sides and is abundantly supplied with windows, double for winter, and with fly screens in summer. Even the milk room is under the same roof, but it is so far separated from the stable that no odors can reach it. If all the farmers of the Commonwealth should use as much common sense, vigilance and care as this man they could make the best of milk and at the same time, with a slight increase in price, a fair living. The product of this farm is cream, the skimmed milk being fed out upon the premises and the land improved in fertility from year to year. These ideas are applicable to almost any stable in the average barn, and at no great cost.

Forty or fifty years ago the barns were perfectly ventilated with half-inch cracks between the boards, but too cold to make milk in economically. Farmers were advised to reboard the barns with matched boards and then inclose the stables, making them air tight, and not to turn their cows out to water, and even to warm the water. Result, vitiated air, no exercise for cattle, debility and tuberculosis. This caused great financial loss to the farmers and the expenditure of hundreds of thousands of dollars by the State to eradicate the disease thus engendered. Next, farmers were advised to build stables large enough to furnish certain air space per cow, and these often proved to be too cold in winter, too warm in summer and sometimes too damp when closed. It is admitted that such stables need not have these faults provided they are properly constructed. These changes have all been costly, and those who have managed to live through them, financially and otherwise, can hardly be blamed if they are inclined to go a little slow along the line of further outlay.

In the beginning of this article milk as secreted from the healthy cow was taken as the ideal. The health of the animal, therefore, becomes a matter of prime importance. Suitable feed, pure water, good ventilation, proper exercise and good care are all necessary. The confinement of cows in stables is, of course, unnatural, but has to be endured like all artificialities. The question comes on where to draw the line between the essentials and the non essentials, and that is usually governed by common sense and the exigencies of the case. There is such a thing as being "more nice than wise," and the successful dairyman will be the one who can draw this line to a nicety, accomplishing results with minimum expense. Some people object to using stanchions, but the stanchion is not hard for the cow after she becomes used to it. Tying a cow up at all might with equal propriety be considered cruel. The real inhumanity comes from the practice of keeping the cows in stables *all the time*, and as a limited amount of exercise in the open air is highly essential to perfect health, it is a serious question whether or not water in front of a cow at all times is altogether a good thing especially if the cow is thereby deprived of her daily exercise. Such contrivances are costly, on the one hand, but are convenient and labor saving on the other.

To keep cows clean involves time and labor; how to reduce these to lowest terms is most important. There is a variety of tie-ups, and about as many different opinions regarding the same. Probably for most dairymen some form of stanchion will, on the whole, be best. This because the cow is held more firmly in place and cannot track so much manure upon the platform, as is often the case where a cow is fastened by chains, and then, too, with stanchions it is possible to fasten a short chain to one stanchion by staple in front or rear, just below the throat of the cow, and in the other stanchion there should be a staple with an eye. The chain, provided with a snap at one end, should be just long enough to reach across and catch into this eye. This chain can be used to keep the cow from lying down after she has been cleaned and unfastened after the milking has been accomplished.

The floor planks in the platform must be of proper length and should always be as short as possible for the cow to stand on comfortably, and if the cows vary in size should be, say, 4 feet 2 inches at one end and 4 feet 8 inches, more or less, at the other, depending upon the size of the cows, and the cows tied according to size, the smallest at one end and so on up to the largest. The gutter behind the cows should be as deep as the circumstances will allow and not too wide. By this arrangement the manure is dropped in the gutter and but little on the platform. By keeping the manure off the cows much subsequent labor is saved.

The cows during periods of confinement in the stable should be groomed enough to keep them clean, aside from cleaning their flanks and udders. This work can be easily and quickly done by using a partially worn-out broom with a part of the handle sawed off. A man with snap in him, a live man, with this implement, using both hands, can go over a fair-sized herd of animals in the time usually taken by

the average hired man in grooming two or three animals with the curry comb and brush.

With the stanchions and cross chain already described the cows can be made to arise and remain standing while the udder and flanks are cleaned, washed if need be, and thoroughly wiped, and left in a damp but not wet condition. If clean milk is to be drawn there must be no dirt or loose skin left upon the cow or upon the milker's hands that can by any means get into the pail.

A good pail to use can be made by any tinsmith and should be carefully and smoothly soldered. There should be soldered upon the top a cover with a round opening of not more than $6\frac{1}{2}$ inches in diameter, into which is placed and not fastened a strainer dish 7 inches across the top and 6 inches across the bottom. This strainer should be a tin dish with a bottom mesh of fine copper wire. At each milking two thin layers of sterilized absorbent cotton, the fibre of one layer across the fibre of the other, should be placed in the dish, and over this sterilized strainer cloth, which should come up and over the sides of the dish and be secured by a ring of tin snugly fitting the inside of the dish. Care must be taken to have the dish not less than $2\frac{1}{2}$ inches deep and the ring inside 3 inches deep, thus projecting somewhat above the top of the dish, otherwise the milk will be liable to spatter. At the side of the pail and as near the top as can be placed there should be a short spout for emptying, and this should be kept covered with a cap when the pail is in use, this cap being removed only when necessary to pour out the milk. The pad of cotton forms a perfect strainer for minute chance dirt which has thus far escaped the utmost care, and also as soon as wet it practically seals the milk from the stable air. It is a safeguard from contamination by flies and should be thrown away at the end of the milking. Such a pad costs about $\frac{1}{4}$ of a cent, and, properly used, will last while milking from 10 to 15 cows. There should be no feeding or raising of dust in the stable just before or during milking time.

The milk once drawn should be taken immediately to the milk room, which should always be outside the stable, and preferably though not necessarily outside the barn, and should, with all utensils, be kept scrupulously clean, and in summer time thoroughly protected from flies. The milk should here be aerated and cooled at once to 40 degrees F. or below. If cream is separated the same practices regarding cleanliness must be observed, and the cream at once cooled and bottled. Milk or cream thus produced and kept at proper temperature I have personally known to keep in *perfect condition* ten days or more.

All this may seem an exceedingly difficult task, it is so different from old customs, but it is essential. Compare it, for instance, with daily removing manure and spreading it on the land, a practice often recommended which I do not condemn if a person wants and can afford to do it that way. But the time taken up in harnessing and unharnessing for one load when it would take no longer to do it for twenty loads, and the more or less wasteful practice of applying manure at times when it cannot readily be incorporated with the soil, but must be subject, for a

greater or less period, to the wasting influence of washing from rain and melting snow and drying by sun and wind, do not commend it as a practical method of handling farm manure to the best advantage. The old-time barn-cellar, if properly cared for, is still the most economical place in which to temporarily care for manure, and if the stable floor is tight and the cellar properly ventilated there need be no more contamination of milk from it than if the manure were in South Africa.

All this probably means 10 cents a quart, retail price, for milk in Boston, and the farmer to get the increase. Beyond what is here advised, the producer of a fancy article of milk can go to any extent he pleases, and his purse and those of his customers will allow. But for all practical purposes, milk made in this manner will be good enough for anybody, and will be as good as the average producer can afford to make, or the average consumer buy.

